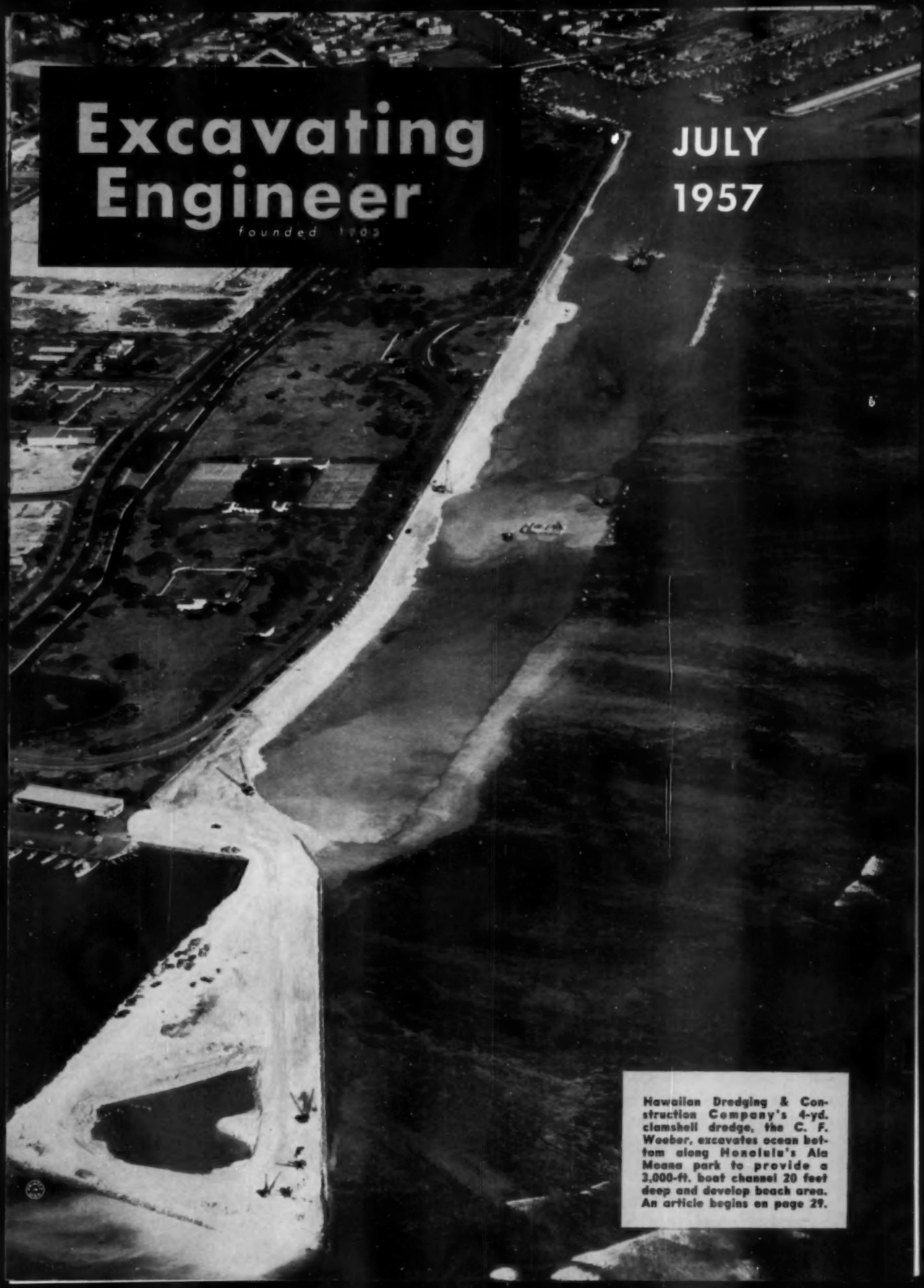
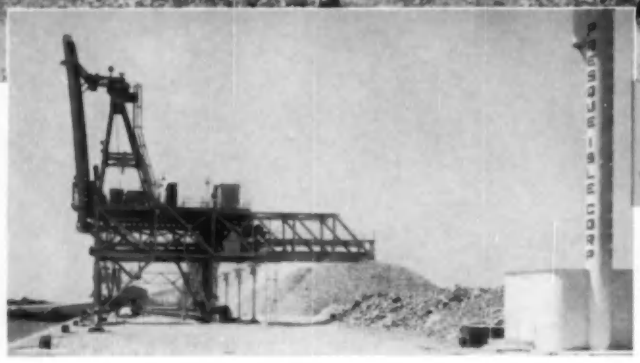
Excavating Engineer

founded 1903

JULY
1957



Hawaiian Dredging & Construction Company's 4-yd. clamshell dredge, the C. F. Weeber, excavates ocean bottom along Honolulu's Ala Moana park to provide a 3,000-ft. boat channel 20 feet deep and develop beach area. An article begins on page 29.



This is one of three 190-B shovels used to load out limestone from Presque Isle Corporation's quarry at its Stoneport location.

Here is Presque Isle Corporation's loading site at Alpena, Mich.

In Michigan . . .
and the world over

WHERE DEPENDABILITY IS ESSENTIAL BUCYRUS-ERIES ARE FAVORITES

The entire production of the Presque Isle Corporation's limestone quarry and crushing plant is transported by boat. Consequently, operation of the 1740-ton-per-hour plant is limited to the length of the shipping season on Lake Huron. To keep its Stoneport (Mich.) operation going at full capacity during this shortened working season, the company uses three Bucyrus-Erie 8-yd. 190-B electric shovels.

The high output of the three Bucyrus-Erie Ward Leonard electric shovels keeps quarry production ahead of plant capacity . . . all season long. If sustained high output is essential to *your* operations, investigate this outstanding line of heavy-duty excavators.

127L57C

A Familiar Sign BUCYRUS ERIE *at the Scene of Progress*

BUCYRUS-ERIE COMPANY • South Milwaukee, Wisconsin

One of the B-80 dumpers operated by Morse Sand & Gravel Company, Inc., of Attleboro, Mass.

two gravel-hauling dumpers supply 20 ready-mix trucks

"Our two Mack dumpers operate nine hours a day supplying gravel for our fleet of 20 ready-mix trucks. Averaging six round trips an hour over our own roads, these Macks have hauled over 350,000 tons in the last six months. Continuous operation of these two dumpers is vital to us. That's why we chose Macks . . . and they've more than lived up to their reputation. So far, we've had only routine maintenance and service to contend with." This is the experience of Mr. Alfred H. Morse, president of Morse Sand & Gravel.

Macks are universally acknowledged for their outstanding performance, operating economy and stamina. On-the-job operating reports, like Mr. Morse's, show why.

Want more proof? Let your Mack representative show you the performance records of other Mack users in your area—operators who found out how much they can profit by using the best. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

BUCYRUS-ERIE COMPANY • South Milwaukee, Wisconsin

Four DW15s move 350 yards of hard clay per hour on half-mile haul

H. H. Howard and one of the DW15 rigs, with D8 (Series E) pushing.

Working on State Highway 26, south of Daingerfield, Texas, J. E. & H. H. Howard have a 735,000-yard contract to raise the roadbed and widen part of it to four lanes.

When this picture was taken, all the earthmoving was being done by four CAT* DW15 Tractors with Scrapers, push-loaded by a D8. The spread averaged 3,500 cu. yd. of hard Texas clay per 10-hour day, hauling half a mile.

H. H. Howard says: "Our DW15s have worked steady for a year and a half with no trouble whatsoever except to replace an occasional cable. With the new D8 to push, we can load in a few seconds and keep all four scraper units on the run. Now we're buying a fifth DW15." This unit, incidentally, will make the twenty-fifth DW15 in the Howard fleet.

Now Caterpillar offers a *new* DW15 (Series E) with a new No. 428 LOWBOWL Scraper. The Cat high-torque Engine, specifically designed for the DW15, delivers 200 HP (maximum output capacity). With speeds up to 37.2 MPH, plus the extra sure-footedness of four-wheel traction, this rig gives you faster hauls and cycle times with greater safety. The No. 428 Scraper has a capacity of 13 cu. yd. struck—18 cu. yd. heaped—and it loads quicker and more easily because of LOWBOWL design.

Let your Caterpillar Dealer give you an on-the-job demonstration of this unit. Remember, he stands behind every machine he sells with prompt, reliable service and Caterpillar parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—
THE HARD WORK

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Excavating Engineer

founded 1905

South Milwaukee, Wisconsin

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Hawaiian Dredging & Construction Co., Ltd. has been literally building the Islands for 55 years. Great strides have been made to bring the Territory into ever increasing world importance.

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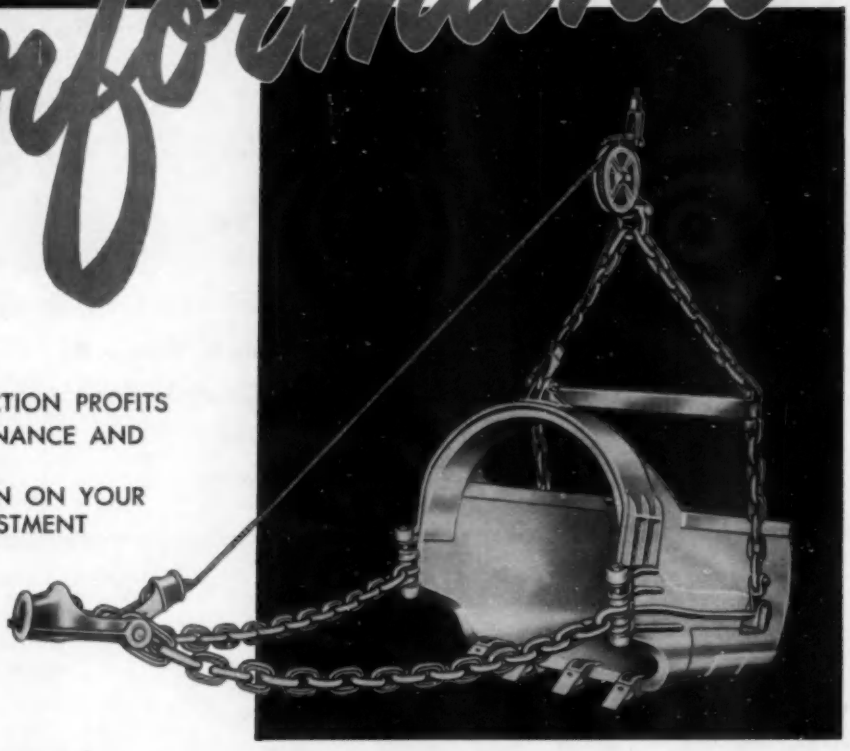
Perforated or Solid...

HENDRIX
DRAGLINE BUCKETS

set
new
standards
of...

Performance



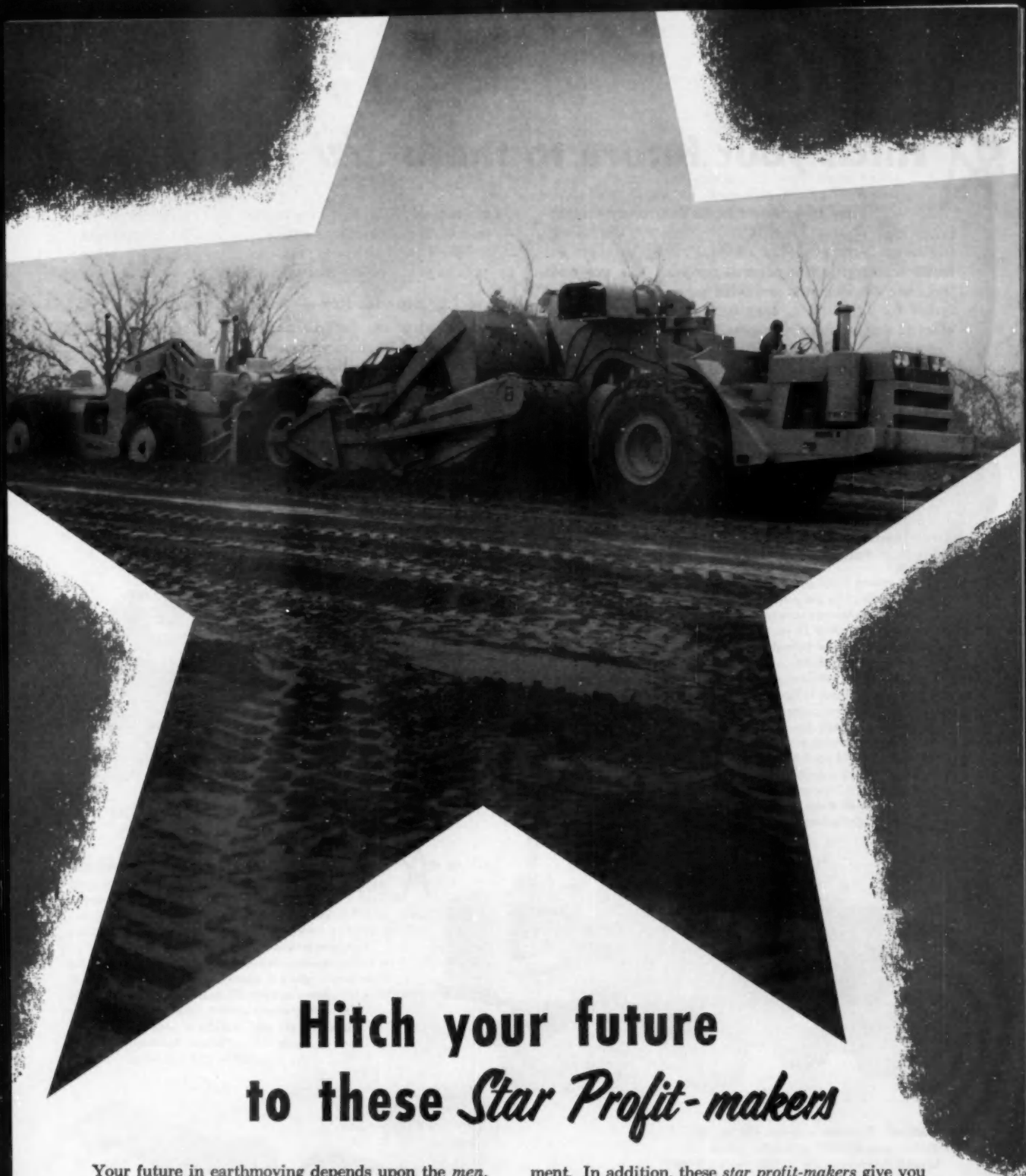
- TOPS IN PRODUCTION PROFITS
- LOW IN MAINTENANCE AND SERVICE COSTS
- A BIGGER RETURN ON YOUR EQUIPMENT INVESTMENT

Hendrix Lightweight Dragline Buckets

A TYPE FOR EVERY DIGGING PURPOSE—¼ to 40 Cubic Yards

HENDRIX MANUFACTURING COMPANY, Inc.

MANSFIELD, LOUISIANA



Hitch your future to these *Star Profit-makers*

Your future in earthmoving depends upon the *men, machines,* and *management* you can put together as an organized work team. Your objective is to handle bigger yardages, in shorter time limits, at bigger profits. Among the *star profit-makers* necessary to put you "on top" are modern machines that will *work* faster, *travel* faster, and operate at *higher mechanical efficiency*. You get these important advantages in job-tested LeTourneau-Westinghouse equipment. In addition, these *star profit-makers* give you the balanced combination of power, traction, speed, and mobility — necessary to increase production and pay you a bigger return on your investment in equipment and personal effort.

turn page for more details on Star Profit-makers

advertisement

(continued)

Hitch your future to these *Star Profit-makers*

Your investment in LeTourneau-Westinghouse high-production earthmovers assures the following advantages: (a) low, wide Fullpak scrapers for faster loading, lowest-net-cost-per-yard (b) powerful Tournapull prime-movers with power-transfer differential for high-speed, traction, and durability (c) electric controls for lightning-fast action . . . and (d) independent brake control with more braking surface than any other earthmover, for maximum safety.

Check the complete line of job-tested LeTourneau-Westinghouse equipment including self-propelled scrapers . . . go-anywhere rear-dumps . . . powerful, heavy-duty, rubber-tired tractors . . . and heavy-duty graders with 15 speeds for higher work capacity. Every one of these machines offers you special advantages in work ability, speed, and mobility — important to you in planning for new opportunities.

Standardize — for extra profits

Standardize on LeTourneau-Westinghouse earthmovers and be money ahead. Many components and parts are interchangeable between various machines to lower your parts inventory and equipment investment. In addition, similar design features will enable your mechanics and operators to become more proficient in their work . . . help you cut costs . . . earn *extra profits.*

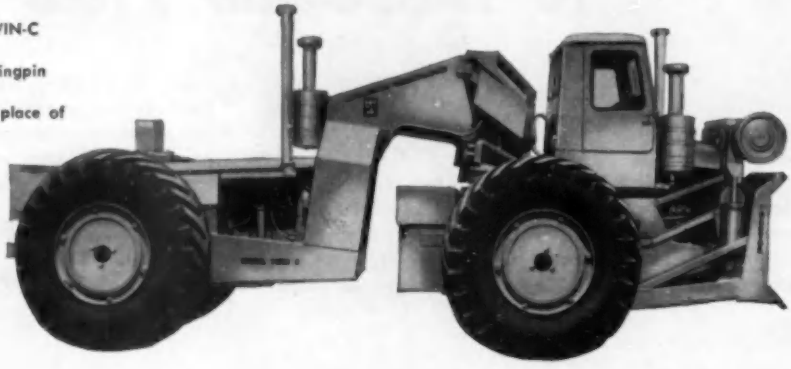
Easy-loading 27-yd. B and 18-yd. C Fullpak scrapers —

Fullpak scrapers have an established record for easy loading. Its job-proven design has been in world-wide service for over a year on fast-loading 18-yd. C Tournapull. Low, wide Fullpak bowl loads *faster* . . . boils *better* . . . fills corners and heaps low-void payloads. Low push-block is right height for all push tractors . . . carries thrust direct to blade for maximum cutting power. Available with 210 hp C Tournapull and 293 hp B Tournapull. Both prime-movers interchange with rear-dumps and crane. Bottom-dump, logging-arch, side-dump and flatbed available for C Tournapull.

9-yd. D Tournapull-scraper —

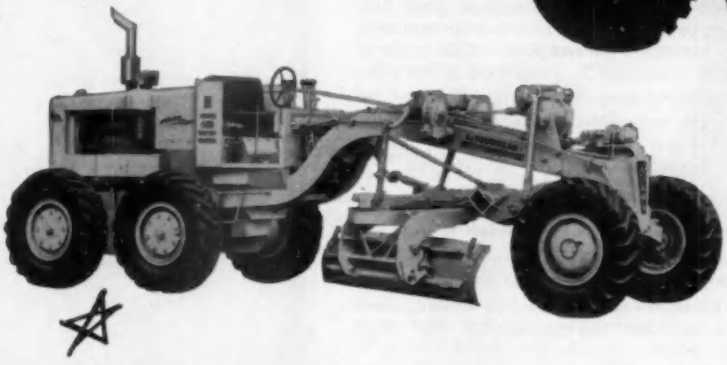
Your "handyman" tool . . . handles any kind of dirtmoving, from odd-lot clean-up jobs to production hauling. Works alone or in fleets. Only 8' wide, and within 9-ton axle-load limit, 29 mph "D" travels anywhere without permit. Prime-mover interchanges with rear-dump, logging-arch, crane, flatbed. Bulldozer blade also available.

Twin-C Pusher — Giant 420 hp TWIN-C Pusher, with 80,000# of weight. Loads biggest scrapers easily . . . has geared kingpin power-steering . . . travels at 20 mph forward, reverse to 5.8 mph. Takes the place of tandem pushers for your big scrapers. Gets bigger loads fast, at less cost.



Tournatractor — 210 hp Model "C" of 30,000 + # ... works and travels on-or-off roads to 17.2 mph forward, 7.3 mph reverse. Push-plate, Dozer blade, Angle-dozer, Root Rake, V-Snow Plow, Snow Wing, Winch, Tree Pusher, and Power-Control-Unit also available. Versatile Tournatractor dozes, clears, push-loads, skids, tows, operates electric-control scrapers. With RR coupling at rear, unit becomes SwitchTractor. New 210 hp, off-track SwitchMobile also available for RR switching.

Rear-Dumps — 11, 22, and 35-ton haulers have bodies with triple-layer, all-steel floor ... haul on-or-off highways at speeds to 34.4 mph. Unit makes continuous U-turns in less space than Rear-Dump's own length. In dump position, it turns in only about ⅔ of overall length! These electric-control haulers dump clear over bank, pull out safely with front-wheel drive. Interchangeable scrapers, bottom-dumps, side-dumps, and flatbeds also available.



TraveLoader — Self-propelled, belt-type machine with choice of 55 hp gasoline or 60 hp diesel engine. Picks up and loads loose materials into trucks from windrow or stockpile at truck-a-minute speed. Loads snow up to 20 yds. per minute, other materials up to 10 yds. per minute. Roads to 26 mph.

Adams Graders — Six models, 15,500 to 30,200 lbs.; 60, 80, 115, 123, 150, 190 hp. Standard heavy-duty models have 8 forward speeds to 26 mph, 4 reverse to 13 mph, and 3 optional creeper speeds. POWER-Flow 660 with torque converter, gives infinite speeds forward to 27.4 mph, reverse to 24.4 mph. 60 hp "220" has 9 speeds forward, with optional creeper gears ... best in its class. Choice of GM or Cummins engines on 5 larger models. Snow Plow, Wing, V-type Scarifier, Power-shift Moldboard, Bulldozer, Rotary Snow Plow, and "Snow-Blo" attachment for wing also available for Adams graders.

Elegrader — Excavates, elevates dirt up conveyor for casting or loading. Attaches to Adams 440, 550, 610, 660 graders; fits Cat 12.

LeTourneau-Westinghouse also manufactures: Tractor-drawn scrapers, Power-Control-Units, Rooters, Sheepsfoot Rollers, Jib Cranes, and Tournarope (from ¼" to 1½" dia.).

(see next page)

☆ *Star Profit-makers* . . . the result of 30 years of constant improvement

LeTourneau-Westinghouse Company — through 30 years of constant research and engineering — pioneered and introduced designs and features that have played a major role in contributing toward the progress of modern earthmoving methods and machines.

When LeTourneau-Westinghouse first introduced the 2-wheel rubber-tired prime-mover there were many who scoffed at the idea. But over the years this principle of 2-wheel prime-mover — with interchangeable trailing units — has demonstrated certain economies and advantages which now are the goal of many leading equipment manufacturers. As evidenced at the 1957 Road Show, in Chicago, the original "Tournapull" idea is here to stay.

Meet your LeTourneau-Westinghouse Distributor

To provide you with dependable equipment . . . and the best possible customer service . . . your LeTourneau-Westinghouse Distributor has invested substantially in modern earthmoving tools and service facilities. His shop is well-equipped . . . his stock is complete . . . his staff is factory-trained to help you keep your equipment operating at top efficiency. So . . . get acquainted with your L-W Distributor . . . whether your need is *now*, or in the future. You will be welcome.

LeTourneau-Westinghouse — pioneer in earthmoving equipment

In addition to the rubber-tired 2-wheel prime-mover, LeTourneau-Westinghouse was *first* to bring you such money-making features as:

FIRST scraper to dig, carry and spread.

FIRST scraper with positive load ejection to spread stickiest materials.

FIRST with all-welded steel construction of box-beam design, for less dead weight, maximum pay-yards per pound of scraper weight.

FIRST electric-welded road graders.

FIRST to promote giant rubber tires for extra load-carrying capacity and greater flotation.

FIRST to give you a scraper over 12 yards capacity, for bigger pay yardage from your tractor horsepower.

FIRST heavy-duty tractor with rubber tires, for high-speed and mobility.

FIRST road grader with leaning wheels.

These are just a few of the many L-W developments that have helped speed dirtmoving and give you lowest-net-cost-per-yard.

Manufacturer of Tournapulls*, Tournatractors*, Twin C** Tractors, SwitchTractors**, SwitchMobiles**, Rear-Dump and Bottom-Dump Haulers, Flat-Bed Haulers, Logging Arches and Winches, Cranes, Full-pak** Scrapers, Tractor-Drawn Scrapers, Rooters, Sheepsfoot Rollers, Angledozers*, Bulldozers, Snow Plows, Adams** Motor Graders and TraveLoaders and related attachments, Power Control Units, Tournarope* and Tournaweld*.

*Trademark Reg. U.S. Pat. Off.
**Trademark G-1425-G

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company
Where quality is a habit

Why new 27-yd. B FULLPAK* scraper

is your best bet for low-cost dirtmoving

The all-new LeTourneau-Westinghouse 28 mph B Tournapull®, with 27-yd. Fullpak scraper, gets *big* loads *fast!* Lower, wider, bigger... this giant dirtmover delivers more pay-yards at lower-net-cost than any scraper on the market. That means more profits for you...

Job-proven design

The new low, wide B Fullpak scraper incorporates popular high-production features that have been job-proven in world-wide service — for over a year — on the modern 18-yd. C Fullpak. Shallow bowl design means Fullpak needs less force for *lifting dirt* . . . can apply more to *cutting* and *pulling*. Bowl bottom has only 1° rise when loading. With dirt flow nearly horizontal, quick-loading 27-yd. Fullpak packs full-capacity, low-void payloads fast!

Better boiling

Tailgate has curved top, to roll material up and forward into a high heap. Side-sheets sweep higher in center, to reduce spillage and deflect material into corners of apron and tailgate. High, deeply curved apron adds bonus dirt-capacity . . . carries a big part of load forward in its "belly", for better weight distribution, lower center of gravity, and improved stability and traction.

Faster loading . . . unloading

High apron lift (7'1" above blade) speeds loading and unloading. Smooth, streamlined side-arms and side-sheets prevent chunks from being trapped. Positive forward-ejection tailgate has plenty of power to force out sticky clay, mud, rocks — wipes bowl clean in a single pass.

90° turns

Electric steer, through geared kingpin, permits short 90° turns. New B Fullpak makes continuous 180° turn in area only 39'10" wide. Also, positive kingpin steer enables operator to swing prime-mover from side-to-side in soft ground to let drive wheels find better footing and "walk" unit out of mud or loose sand.

Better visibility

Cockpit is raised to give Tournapull operator clear view of blade, load, pusher. Road ahead is always in full view. Permits safe, high-speed cycles.

Get all the facts

Get full details on the new B Fullpak — and on other job-tested LeTourneau-Westinghouse earthmovers. See why they'll help you move dirt faster, easier, at lowest-net-cost-per-yard. Write or phone for all the facts.

*Trademark BP-1403-G-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

from here . . .

You can select with confidence from the Bucyrus-Erie line of convertible excavators because they deliver dependable performance when and where you need it most. Quality control of materials, advanced engineering, and skilled manufacturing put *quality in action* on your excavating, lifting, and material handling jobs. Fit Bucyrus-Eries to your needs today and depend on them for tomorrow's profits.

The structures and physical properties of all metals used in Bucyrus-Erie machines are important factors in their strength and durability. Here, a metallographic microscope is being used to check the structure of a sample of metal.

BUCYRUS-ERIE

making money for contractors

A 1½-yd. Bucyrus-Erie 38-B clamshell owned by the Massman Construction Co., Kansas City, Mo., excavates inside a bridge pier caisson along the Red River near Natchitoches, La., for the State Highway Department.

A 25-ton capacity Bucyrus-Erie 22-B Transit Crane, owned by the W. E. O'Neil Construction Co., Chicago, Ill., is pouring concrete for an overpass structure along the Indiana Turnpike near Hammond.

BUCYRUS-ERIE COMPANY

to dependability

Rock and earth hills overlooking San Francisco Bay are cut down by a Bucyrus-Erie 4-cu. yd. 88-B shovel in the construction of the San Francisco Freeway. Machine is owned by the Guy F. Atkinson Co., So. San Francisco, Calif.

This recently introduced Bucyrus-Erie 30-B dragshovel trenches for a sanitary sewer line on the outskirts of Milwaukee, Wis., before a new road is constructed.

QUALITY IN ACTION---
on road jobs all over the country

A 3-yd. Bucyrus-Erie 71-B dragline excavates earth and sand during the early stages of the Indiana Turnpike construction.

HERE'S working proof of top performance on highway, road, and street construction jobs throughout the country. Modern Bucyrus-Eries stand out for high output, easy operation, low cost maintenance, quick convertibility, and long life service. These and other cost-cutting features can help give your operations the profit boost needed to keep you ahead of your competition in today's multi-billion dollar road-building program.

For complete information on Bucyrus-Erie ⅜- to 4-yd. excavators and cranes and 15-, 25-, and 35-ton Transit Cranes, get in touch with your local Bucyrus-Erie distributor today. 320E57C

BUCYRUS ERIE

South Milwaukee, Wisconsin

PLAIN PRIMACORD

Textile-covered, flexible and resilient. Suitable for surface trunk lines and shallow holes where tensile strength and resistance to abrasion and cutting are not required. Tensile strength 125 lbs. 1000-ft. spool 17 lbs.

REINFORCED PRIMACORD

Textile reinforced, tough, resilient, flexible. Recommended for surface trunk lines and deep holes where normal strength and resistance to abrasion and cutting are needed. Tensile strength 160 lbs. 1000-ft. spool 18 lbs.

PLASTIC WIRE COUNTERED PRIMACORD

Armored with wire and covered with plastic material. Recommended for use in deep, ragged holes or with metal or fibre explosives containers, where strength and resistance to abrasion and cutting are essential. Tensile strength 300 lbs. 1000-ft. spool 33 lbs.

BLASTERS AGREE that thunderstorms, high tension lines, power cables — even two-way radios — can be sources of stray electrical currents . . . and that these can cause premature shots under certain conditions.

The best safeguard against such hazards is to use a detonating agent which is insensitive to stray electrical currents.

In primary blasting, use Primacord as the detonating agent in each hole and also as the trunk lines to connect all holes so that they will fire in proper rotation. The entire blast can be detonated from one point on the trunk line — with fuse and cap or electric blasting cap. This final hook-up is made only when all is in readiness and when it is *safe* to fire.

In secondary blasting, use Detacord to prime each charge and to connect all charges, detonating it in the same way.

If your holes are primed with fuse and cap, connect the fuses with Quarrycord.

For more information, see your explosives supplier or write to

PLASTIC REINFORCED PRIMACORD

Covered with tough plastic material, not affected by high Summer heat or Winter cold. Waterproof—resistant to acids commonly encountered. Use for extremely deep holes, river crossings, field shots that must stand for long periods of time and in other wet conditions. Tensile strength 275 lbs. 1000-ft. spool 22 lbs.

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut . Since 1836

Primacord and Detacord Detonating Fuse, Ignitacord,® Quarrycord, Safety Fuse, Pyrotechnical Devices and Blasting Accessories

DETACORD

Smaller (and less powerful) than Primacord. Core of PETN is textile-reinforced and wax finished. Identified by light brown surface with cross windings of red yarn forming an "X" pattern. Resilient, flexible. An economical detonating fuse for use in secondary blasting, long hole underground blasting and pipe-line ditching. *Not* recommended for primary blasting. Tensile strength 100 lbs. 500-ft spool weighs 8 lbs.; 1000-ft spool weighs 16 lbs.

QUARRYCORD

Used to connect and ignite safety fuse in secondary blasting. Burns progressively with an external flame at the zone of burning — about one foot per second. Flexible — not affected by stray currents. 500 ft. spools. Quarrycord Connectors — 100 in a box.

USE

P-4

PRIMACORD® • DETACORD® • QUARRYCORD®

Leading Fleet Owners Depend . . . on Manitowoc

All over the country leading contractors have come to depend on Manitowoc for big, steady production, rugged service and long-life. Dozens of repeat sales to fleet owners prove that superior Manitowoc performance leads to additional orders when the purchase of new machines is considered.

Manitowocs are the choice of successful contractors because there's greater utilization of engine power through direct power flow to the dipper. As a result, operating cycles are faster . . . help to finish jobs ahead of schedule. This simplicity of design cuts down on the number of moving parts, keeps downtime negligible. Smaller rigs in the line offer greater weight with the lowest cost per pound of machine in the industry. Larger units like the 5½-yd. Model 4500 shown above have the beef and brawn needed for the big, tough jobs, yet are as mobile as a small excavator. Best of all, quality of Manitowoc construction matches quality of performance.

Join the growing list of earthmoving men who pick Manitowoc for profit. Before you bid your next job be sure to investigate all the Manitowoc advantages — you'll be glad you didn't settle for less!

Manitowoc Engineering Corp.
Manitowoc, Wis.

See Your Manitowoc Distributor

MANITOWOC
SHOVELS 1-5½ YD. Speed Crane CRANES 20-100 TON

Proof of Performance!

Some Nationwide Manitowoc Fleet Sales

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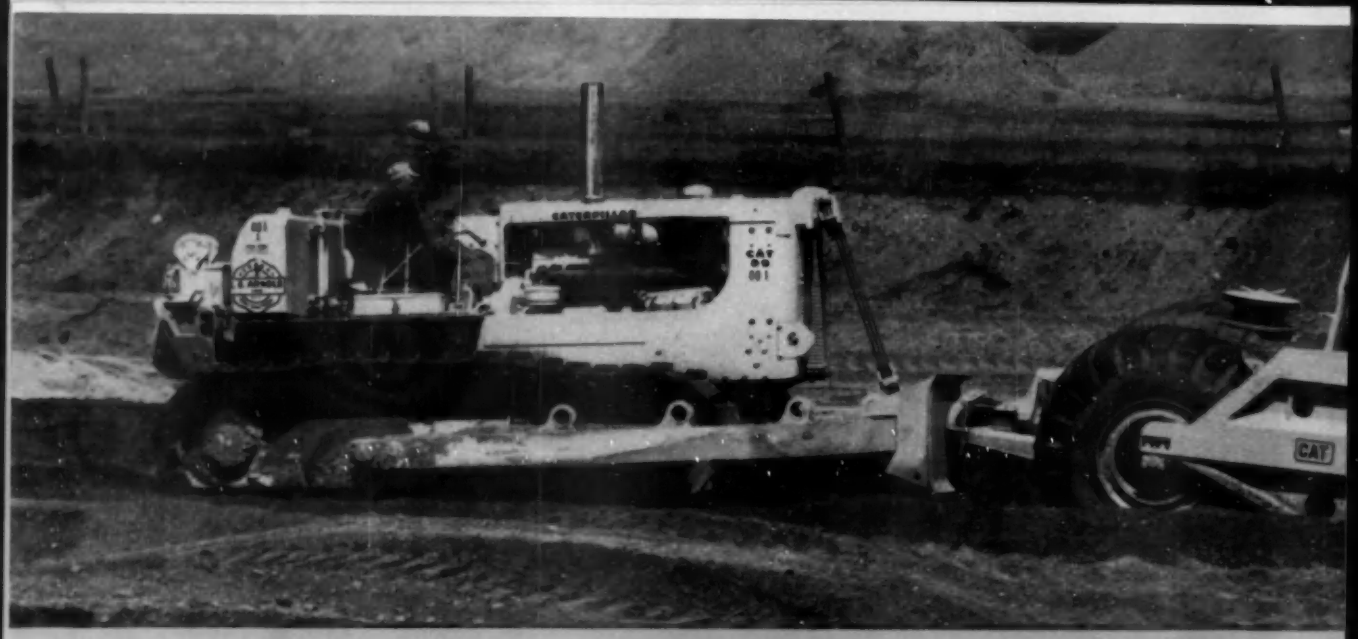
Merritt-Chapman & Scott Corp.
Morrison-Knudsen Company, Inc.
American Bridge Division, U. S. Steel Corporation
Bechtel Corp.
C. F. Braun & Co.
Clemens Construction Co.
Construction Aggregates Corp.
E. I. DuPont de Nemours and Co.
Foster-Wheeler Corp.
Heckett Engineering Co.
Walsh Construction Co.
Stone and Webster Engineering Corp.
Utah Construction Co.
M. W. Kellogg Co.
Koppers Co., Inc.
Peter Kiewit & Sons Co.
Massman Construction Co.
McDowell Co., Inc.
Medusa Portland Cement Company
Dravo Corporation
Geo. M. Brewster & Son, Inc.
Brown & Root, Inc.
Whitehead & Kales Co.
Raymond Concrete Pile Company
United Engineers & Constructors, Inc.
Kaminski Brothers, Inc.
The Lummus Company
Booth & Flinn Co.
Chicago Bridge & Iron Company
Altoona Construction Co.
The A. Bentley & Sons Co.
O. W. Burke Company
Bushman Construction Co.
Nicholas Fornabai
The Foundation Company
McCarrick Brothers, Inc.
A. I. Savin Company
Tidewater Construction Corporation



DOES THE KING OF THE CRAWLERS PAY ITS WAY?

Let's talk push-loading. We'll use some figures—that's the only way to tell a dollars-and-cents story.

On a job in Munsing, Michigan, not long ago, a Caterpillar D9 Tractor and a competitive machine were both push-loading in moist sand with some gravel in it. The other machine loaded 18.3 cu. yd. in .91 min. That's 20.1 cu. yd. a minute. The D9 pushed 18.5 cu. yd. into the scraper in only .58 min. That's 31.9 cu. yd. a minute. In other words, the D9 loaded over 50% faster than the other machine, and developed a larger load while doing it.

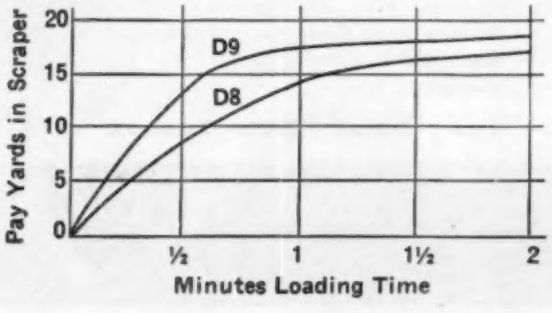
In Belmont, N. C., a D9 and a different competitor were push-loading in sandy clay. The other machine handled 15.3 cu. yd. in .67 min. Or 652 cu. yd. an hour. The D9 handled 17.2 cu. yd. in .42 min. Or 860 cu. yd. an hour. This was a half million cubic yard job; the D9 could have completed it in 3½ weeks less time than the other machine.

On a job in Minot, N. D., on another in Atlanta, Ga., the story was much the same.

Compare a big yellow machine with another big yellow machine

Maybe the best way to spell out how the D9 can boost profits is to compare its performance not with another make but with this famous CAT* D8 Tractor.

Owners and operators know what the D8 will do. Pound for pound, it's the best-producing crawler in its class today. The D9 is bigger, has more power. Does this added size and power really make a difference? Look what happens when you have a D8 and D9 both pushing DW21-No. 21 units on the same job:



D9 push-loads DW21 with No. 470 Scraper on highway job in Wisconsin. Ten-mile job calls for handling 120,960 yards, mostly sandy gravel. D9 loads DW21 in gravel in 70 seconds here, with heaping loads up to 25 yards. Vice President F. L. Carr of L. G. Arnold, Inc., says, "The D9 pusher has more than lived up to our expectations." Grade Superintendent Phil Dudenhoefer adds, "Outproduces by far any other machines on the job."

Forget size, weight, horsepower. Forget toughness and agility. These only point to what counts most: out on the job, how does the D9 really stack up against competition in cost-per-yard?

Or compare these two big yellow machines this way. Say on a job your haul distance averages 1,875 feet and you're using three DW21-No. 21s with one pusher. If that pusher is a D8, you stand to average 344 yards an hour. If it's a D9, you'll get 412.

Now, say your spread is made up of the pusher and the three wheel units, plus a No. 12 Motor Grader and another crawler with 'dozer and roller. Figure your hourly owning and operating cost. Count in the depreciation, taxes, gas and fuel, lube oil, grease, repairs and labor, and operators' wages. If your pusher is a D8, a reasonable figure for the spread would be $73.52 an hour. If it's a D9, your costs could come to $77.32. But remember, you're getting 344 yards with the D8, and that comes to 21.4¢ an hour per yard of dirt. With the D9, you're getting 412 yards at $77.32 an hour—which figures out at 18.7¢ per yard of dirt.

The D9 would save you 2.7¢ per yard, *and* give you 68 more yards, each and every hour.

Naturally, these figures might not exactly match your own. But they are figures based on actual performance records and they tell an honest story.

Would the D9 make more money for you?

There are jobs that would not warrant a D9. With the rugged D8 available, there may be no need to call in the 29-ton, 320-flywheel-HP D9. But the above figures certainly prove this much: on job after job, the D9 *is* paying its way, no matter how close the records are kept. One of these jobs could be yours.

But don't just take our figures for it. Call your Caterpillar Dealer. Have him demonstrate the D9 on your job. Check it with *your* watch, in *your* dirt, against *your* books. *That'll* tell the tale.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE D9— PROFIT BUILDER

Diesel Engines • Tractors • Motor Graders • Earthmoving Equipment

Crawler units are chain-driven from the propelling machinery. Each crawler is independently controlled by an air-operated friction clutch and band brake. Moves can be made up or down a grade of approximately 30% with the derrick up or down. This 40-R moves up to a new location at a Pennsylvania mine.

Manual effort is reduced to a minimum on Bucyrus-Erie rotaries by a remote-controlled, power-driven drill pipe rack which adds or removes drill pipe. Any one of four reserve pipes can be moved into position over the hole and screwed tight by power. The rack also stores pipe not in use. Hole can be drilled continuously for the full length of the pipe before an additional pipe section has to be added.

Continuous drilling progress at this Illinois mine is assured by an exclusive Bucyrus-Erie combination of features — variable drilling speed through Ward Leonard control, and variable down pressure through hydraulic motor control. Operator has smooth, instant, command over rotation of the drill pipe . . . can choose the most efficient speed for a given formation, and vary the speed as needed without stopping the drilling operation.

Cost-Cutting Features Make Bucyrus-Erie Rotaries Favorites in Major Coal Fields

Workmen at an Indiana mine cover a charge with stemming material provided by the 50-R, at right. During drilling, the 50-R uses air bailing to remove cuttings and to cool the bit. Fine cuttings are picked up and handled by a precipitator; heavies pile up around the hole . . . make excellent and economical stemming material.

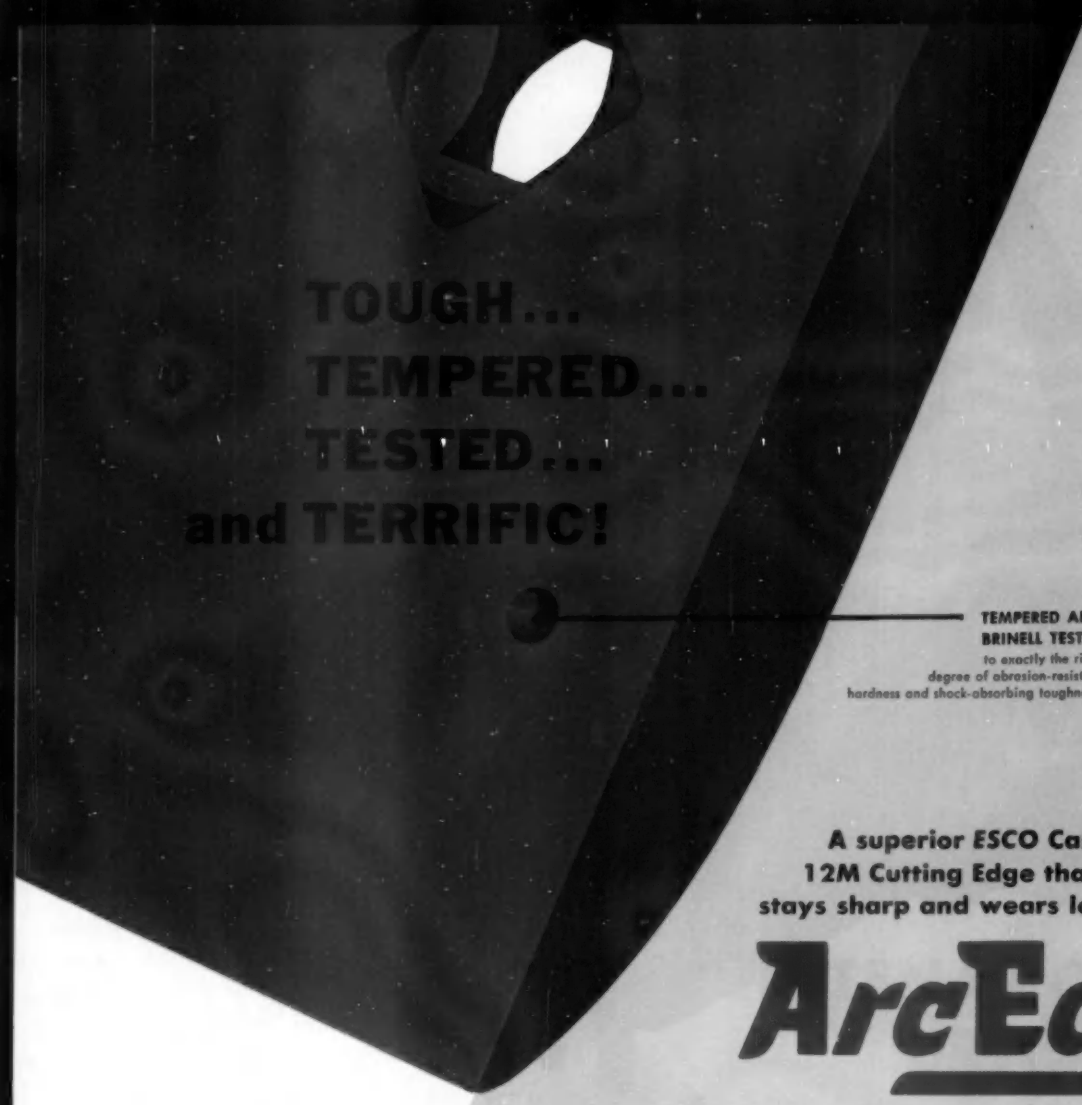
These and other Bucyrus-Erie features are bringing greater economies to coal mines and other open pit operations across the country. Some of the reasons why are indicated in the accompanying captions. For more information on Bucyrus-Erie rotary drills — the 50-R, with electric power, for drilling 9⅞- to 12¼-in. holes; the 40-R, with diesel-electric or full electric power, for drilling 6¾- to 9-in. holes — write, call, or see us today. 55857C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN



TEMPERED AND BRINELL TESTED
to exactly the right degree of abrasion-resistant hardness and shock-absorbing toughness.

A superior ESCO Cast 12M Cutting Edge that starts sharp, stays sharp and wears longer.

ArcEdge

Now Available for Scrapers and Dozers

TOUGH . . .
ESCO Cast 12M Scraper and Dozer Cutting Edges last longer under every digging condition. Because of its high-strength, wear-resistance and shock-absorbing toughness, *ESCO* 12M increases cutting edge life, reduces down-time and keeps your equipment operating far more profitably on every job.

TEMPERED . . .
ESCO Cast 12M Cutting Edges are Oven-Tempered — that's why the same tough "edge-metal" extends all the way through; there is not just a thin shell of hard surface metal that soon wears away. *ESCO* Cast 12M Cutting Edges will actually outwear ordinary rolled steel blades 5 to 1, and *stop* blade breakage.

TESTED . . .
ESCO Cast 12M Cutting Edges are Brinell Tested to assure you exactly the right combination of wear and shock resistance for longer blade life, fewer blade changes and more profit per job.

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See your *ESCO* Dealer for complete details.

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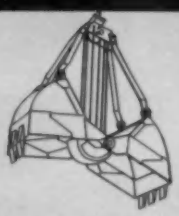
IN CANADA *ESCO* LIMITED



Whether you use your clam for digging or materials rehandling, *ESCO* Teeth will make it "dig in" faster, break up hard material easier. By adding corner teeth, you can make clean, square cuts in trenches and other excavations. Bucket lip wears longer, too, because the teeth take the punishment.

You can change *ESCO* Two-Piece Teeth much faster than ordinary teeth because you replace only the point, not the entire tooth. Instead of removing five bolts, you drive out one pin.

ESCO points are *cast* in *ESCO* 12M, a tough, wear resistant alloy steel. They last longer than ordinary teeth because all *ESCO* points are Brinell tested to be sure they have exactly the right degree of abrasion-resistant hardness for faster digging and longer life. *ESCO* points are designed to start sharp, stay sharp. Seven point shapes available for different digging conditions. *ESCO* Adapters are available to fit points to any clamshell bucket.

Ask your ESCO dealer today how you can increase the performance of your clamshell with ESCO Two-Piece Tested Teeth.

ESCO TWO-PIECE TESTED TEETH

increase clamshell yardage

Get increased yardage from your clamshell, adapt it to a wider variety of jobs profitably, with ESCO Two-Piece Tested Teeth.

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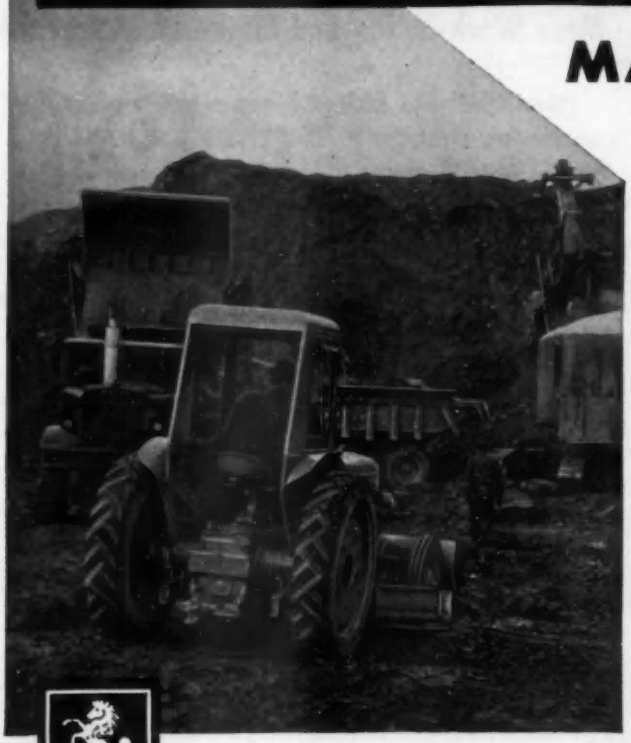
AVELING-BARFORD

MAINTENANCE GRADER



Good "housekeeping" is a sure way to more production. Smooth roads speed-up the working cycle of haul units and reduce their down-time and repair costs. The low-priced Aveling-Barford Maintenance Grader has ample capacity to keep haul roads and working areas around plant clean and tidy all day and every day. Costing but 20% of the price of a big dumper, the Maintenance Grader can often save the costs of such a machine. We should be happy to let you have the 'vital statistics' of this trim 'housemaid.' . . .

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INVICTA

AVELING-BARFORD LTD. • GRANTHAM • ENGLAND

Here's the New R-18 "Euc"

that sets a new high in Rear-Dump Production and Performance!

DUMPS FAST AND CLEAN

Smooth body interior and tapered rear chute assures clean shedding of the load well back of the rear wheels—an important feature for dumping into hoppers or over the edge of waste banks.

STAY ON THE JOB LONGER

Rugged body and frame withstand the impacts of loading, hauling and dumping heavy excavation in construction, mine and quarry service.

More Work-ability and Minimum Maintenance

Designed and built for heavy off-the-highway service, Rear-Dump "Eucs" have paced the field for over 20 years. They've reduced hauling costs on hundreds of the toughest jobs in mine, quarry and construction work . . . delivered "plus" performance year in and year out.

This Model R-18 incorporates the engineering advances, the easy operation and maintenance features, resulting from unequalled field experience with other Euclid Rear-Dumps of 10 to 50 tons capacity. It provides the dependable workability that means more payloads per day at lowest cost per ton or yard moved.

Have your Euclid dealer give you full details on this new 18-ton Rear-Dump and the complete line of Euclid earth moving equipment. He'll be glad to show you why so many users have proved for themselves that ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

The R-18 is your BEST BET for Lower Hauling Costs!

Advanced design results from 20 years of leadership

Some of the* OUTSTANDING FEATURES *of the R-18

- 10½ yd. body 36,000 lb. payload
- 218 h. p.
- loaded top speed of 27 m.p.h.
- hydraulic booster steering
- air assist clutch
- free floating springs
- 16.00 x 25 drive tires

POSITIVE CONTROL OF DUMPING

Double-acting 3 stage Euclid hoist and hydraulic system gives the operator fast, positive control of the body position at all times. Dumping angle of the body, in fully raised position, is 68°. Body, frame and hoist are designed and built as an integral unit.

SPEED AND STABILITY

The 5 speed transmission and Euclid planetary axle provide a top speed of 27 m.p.h. with full 18 ton payload. Free floating Euclid spring suspension gives maximum stability empty or loaded under all road conditions... permits faster safe travel speeds.

EASY OPERATION

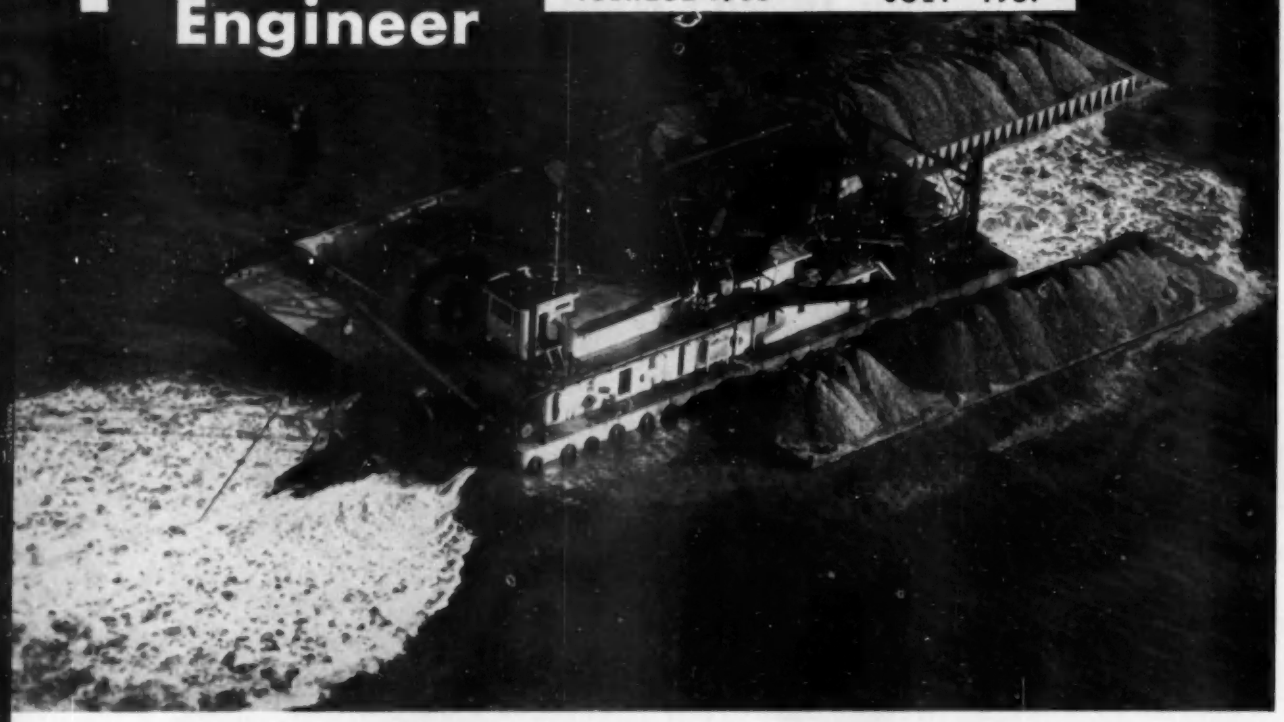
Full width cab offset to left for maximum vision, air assist clutch, booster steering, 218 h.p. engine, fast acting hoist, free floating springs and fully adjustable seat contribute to driver comfort and easy operation.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

The R-18 is your BEST BET for Lower Hauling Costs!

Excavating Engineer
founded 1905 JULY 1957



Largest of Bay Towing & Dredging's dredges is the *Albatross*, which has dredged as much as 146,000 tons of shells a month.

Mobile's Thriving Oyster Shell Business

SINCE World War II, the production of dead reef oyster shells has become a sizable business in the Mobile (Ala.) area. Three wholly-owned subsidiaries of the sprawling Southern Industries Corp. collaborate at Mobile in the large-scale handling and production of oyster and clam shells, sand and gravel. These subsidiaries are: Bay Towing and Dredging Co., Inc., Radcliff Gravel Co., Inc., and Southern Oyster Shell Milling Corp.

Bay Towing & Dredging is the marine and production end of Southern Industries. With a large fleet of dredges, barges and tugs operating between St. Marks, Fla., and Morgan City, La., Bay Towing dredges shell, gravel and sand.

Two of Bay Towing and Dredging's customers are Radcliff and Southern Oyster Shell Milling. Radcliff utilizes the shell, sand and gravel in the production of ready-mix concrete and hot and cold-mix asphalt. In addition to straight sand and gravel sales, Radcliff also produces concrete blocks, using slag from Birmingham (Ala.) steel mills.

Southern Oyster Shell Milling, through a process of grinding, washing and regrinding oyster shells, produces and bags chicken feed (the calcium carbonate content of the dredged shells is 99%).

Island Location

Materials for Radcliff and Southern Oyster Shell Milling are delivered by Bay Towing & Dredging barges to Mobile's McDuffie Island, where Southern Industries centers much of its operations on a 90-acre site.

The Ideal Cement Co., a major customer of Bay Towing & Dredging, uses shells (56% lime) in the manufacture of cement. Raw oyster shells are delivered to Ideal's plants in Mobile and Baton Rouge, La.

McDuffie Island—actually a peninsula located where the Mobile River joins Mobile Bay—is busy day and night. There, large cranes with clamshell buckets unload barges of shells, sand and gravel; in the process, they create sizable stockpiles.

Shells for Southern Oyster Shell Milling are immediately crushed, classified and washed, then reloaded into barges for a trip to the bagging plant on Mobile's Industrial Canal. Some of the material is retained in stockpiles at McDuffie Island for shipment by boat (about one trip a month) to Southern Oyster Shell Milling's bagging plant at Baltimore, Md.

Three subsidiaries of Southern Industries Corp. collaborate in large-scale handling of oyster and clam shells, sand and gravel. Among their products are concrete, asphalt, chicken feed.

Radcliff's facilities on McDuffie include a dry-type batch plant, two asphalt plants and

A long tow of barges filled with oyster shells is brought in from Mobile Bay by the tug *Corporal*. Cranes will unload the shells.

a pug mill. These operate about eight to 10 hours a day.

Radcliff also has a batch plant at Plateau, Ala., 12 miles north of Mobile. Concrete blocks—a maximum of 18,000 per 20-hour day—are manufactured at Radcliff's block plant in Mobile. Southern Industries maintains complete repair facilities for its equipment at the Southern Repair Division, located a mile north of the eastern entrance to Mobile's Bankhead Tunnel.

Radcliff, Bay Towing & Dredging and Southern Oyster Shell Milling maintain offices and other facilities at McDuffie Island in a circle of seven substantial brick buildings which in another day housed facilities for the United States Public Health Service in Mobile.

Southern Industries acquired the buildings and some land on McDuffie several years ago. Adequate docking facilities and protective slips for barges and tugs are provided. There, too, space is ample for concrete batching and asphalt operations and also for stockpiling materials. By maintaining offices at McDuffie, the subsidiaries can better keep abreast of the business. A good blacktop road connects the "island" with the city. It's from McDuffie that operations of Bay Towing & Dredging's fleet are routed with the help of a ship-to-shore radio system and meteorological aids.

Four of Bay Towing & Dredging's

Aerial view of Southern Industries' McDuffie Island facility shows (1) crushing plant, (2) asphalt and (3) concrete plants.

Gravel arriving by barge at the island is unloaded by a new air-controlled crane with a 110-ft. boom and a 4-yd. clam bucket. A Cummins diesel powers the crane.

eight dredges generally load to barges working from McDuffie Island. Two of them, the *Albatross* and the *Flamingo*, dredge dead reef shells in Mobile Bay, about 17 to 20 miles from McDuffie. The *Albatross* has a 15-in. suction pump; the *Flamingo*, a 12-in. pump. More will be said later about the *Albatross*, a modern, diesel-electric dredge. The other two dredges supplying McDuffie are working on the Alabama River. The 8-in. *Kingfisher* dredges sand, and the 12-in. *Shearwater* works in gravel.

The *Shelldrake*, a 12-in. dredge, is digging oyster shells in East Bay, near Panama City, Fla. Two dredges, the 12-in. *Pelican* and the steam-operated *Gull*, a 15-in. unit, dig oyster shells in the Atchafalaya Bay near Morgan City, La. The eighth dredge, known as the *No. 4*, a 10-in. unit, dredges clam shells in Louisiana's Lake Pontchartrain. It is pushed around the lake by a tug boat.

The dredges load to barges which range in size from 105 x 32 x 7 feet to 240 x 50 x 10 feet. Some of the larger barges hold 3,500 cubic yards. The only time the dredges shut down is for 12 hours once every one or two weeks for repairs.

The *Albatross* has dredged as much as 7,125 tons in 24 hours and 146,000 tons in a month. Some other monthly figures include: *Kingfisher*, 18,000 tons; *Shearwater*, 50,000 to 60,000 tons; *Gull*, 60,000 tons; *Pelican*, 100,000 tons; *Shelldrake*, 70,000 tons; *Flamingo*, 70,000 tons; and the *No. 4*, 60,000 tons.

Wherever Bay Towing & Dredging delivers shells, cranes equipped with clamshell buckets do the unloading Three cranes handle the unloading at McDuffie Island. Unloading elsewhere, primarily in Florida and Louisiana, is done by cranes barged to the site. Often these cranes remain lashed to the barge to unload.

Shells dredged in Louisiana waters often are delivered to the Stevens Shell Co., Bay Towing's division in New Orleans.

Three Bucyrus-Erie cranes — two 54-B's and an 88-B—comprise the McDuffie unloading lineup. Men are on duty to operate all three machines 24

hours a day. When *Excavating Engineer* visited McDuffie Island last spring, the 54-B's were unloading shell from a barge. Both machines had 3-yd. buckets; one machine carried a 90-ft. boom, the other an 80-footer. Working in tandem about 15 feet apart—one machine swinging 180° to the left and the other 180° to the right—the 54-B's can make a short chore of unloading a barge. That's the way it was last March 7, when they teamed to unload a flat-deck barge of 1,050 tons of shells in 2 hours 35 minutes. That's an average of about 160 yards an hour per machine.

Both 54-B's are 10 years old. One has a GMC diesel engine, the other a Murphy diesel.

Add 4-Yd. Clam

Because of the increased volume of materials arriving at McDuffie, Southern Industries decided that a 4-yd. clam was needed. The result was purchase of the air-controlled 88-B, which went to work last January 1.

The 88-B, powered by a Cummins diesel engine and carrying a 110-ft. boom, can unload a unit barge holding 2,500 tons of gravel in 6½ to 7 hours. A 2-yd. clam takes 14 hours to do the same job.

Bay Towing's "roving" barge-mounted cranes include two Koehring 605's and two 2½-yd. Northwest 95's. In March, the 605's were in Louisiana —one at Morgan City and the other at

Working in tandem, these two cranes with 3-yd. clams unloaded 1,050 tons of shells from a barge in 2 hours 35 minutes one day last spring. Both are 10 years old.

Kenner—unloading shell. The 95's were unloading shell for road base work at Shalimar and near Panama City. All four cranes are about 10 years old.

Four types of aggregates are used in Radcliff's dry-type batch plant at McDuffie Island, according to Lewie Williams, yard superintendent. These include sand, gravel, pea gravel and Haydite, an expanded clay from the Mississippi River.

The batch plant has a capacity of 75 yards an hour. Its two bins—one of 100 tons capacity and the other 75 tons—are charged by a 30-in. conveyor belt. A 1½-yd. batcher is under the 75-ton bin; a 3-yd. batcher under the 100-ton bin.

Two of the plant's three cement bins hold a combined total of 800 barrels of Type 1 cement; the other holds 400 barrels of Type 2. The cement, transported to McDuffie Island via railroad from Ideal Cement's plant, is unloaded with an undertrack worm and a bucket-type elevator.

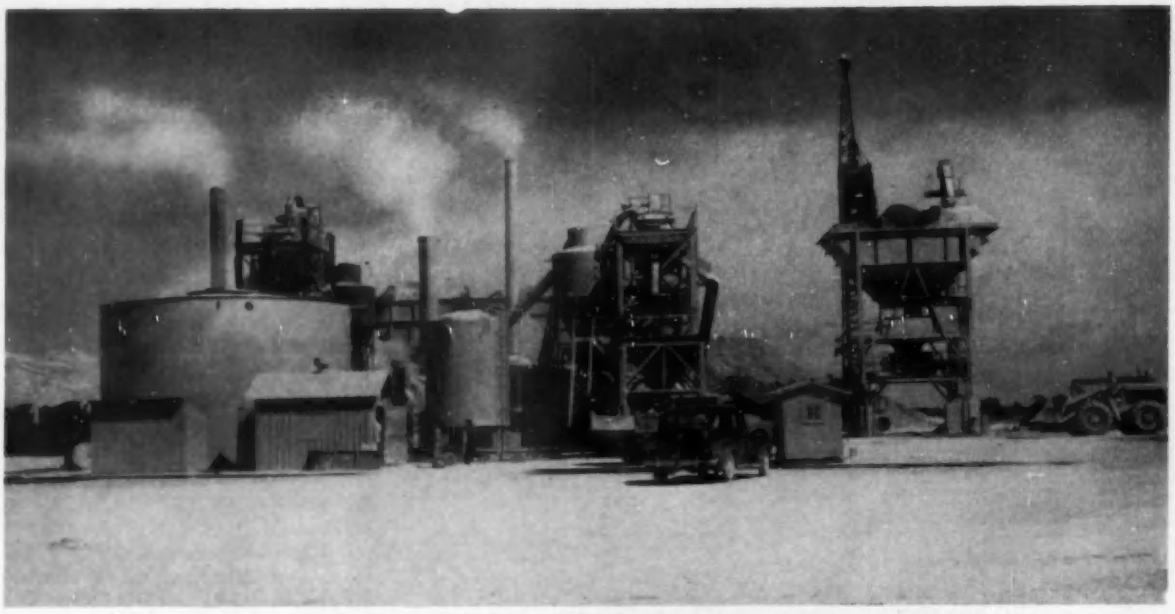
Radcliff's plant at Plateau has a 2-yd. Worthington pre-mixer and one 150-ton bin with a 600-barrel cement storage tank. The plant is charged by a Scoop-Mobile 1½-yd. front-end loader. Aggregates for Plateau are hauled from McDuffie Island in two company GMC 10-yd. tandem-wheeled dumps and a fleet of rented trucks.

Mobile has very little freezing weather, and concrete can be poured every day without additives. Radcliff delivers its concrete in a fleet of more than 30 mixer-truck units—Rex, Jaeger, Challenger and Blaw-Knox mixers mounted on International and GMC trucks. All trucks are equipped with two-way radios.

Radcliff has two asphalt plants in the Mobile area geared to turn out between 1,000 and 1,500 tons per day using crushed shells as its lightweight aggregate. The hot mix is delivered in a radius of 50 to 60 miles of Mobile in rented trucks.

The demand for Radmix, Radcliff's hot-mix asphaltic concrete for cold application, continues to increase. It accounted for nearly one-third of Radcliff's business in 1956, said Ed Meredith, the former Army engineer who

Process of crushing shells into chicken feed begins at McDuffie, where shells are passed through series of screens, crushers.



Here's the McDuffie asphalt plant, one of two Radcliff has in the Mobile area. Plants produce 1,000-1,500 tons per year.

is Radcliff's asphalt plant superintendent. Radmix is shipped into six states —Tennessee, Louisiana, Alabama, Georgia, Mississippi and Florida.

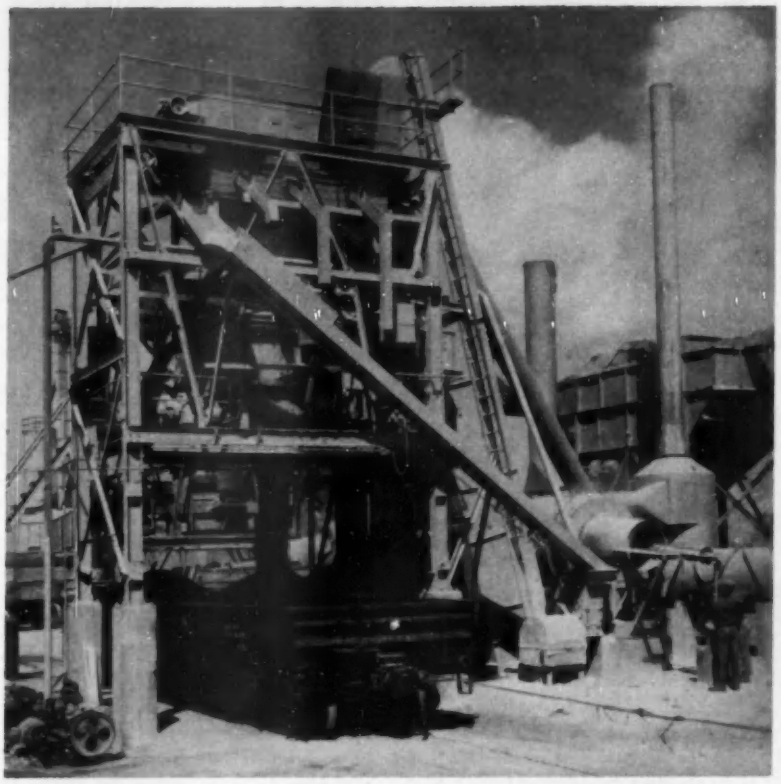
"We're the only people to make cold-mix out of shell aggregate," said Meredith. "The gravel in this area is too small to crush. Radmix utilizes sharp river sand from the Alabama River and crushed shells. The chemical composition of the shell precludes the use of anti-stripping agents. The resulting pavement using Radmix is the dense type, just as hot mix."

Radmix is used by the highway departments of Alabama, Louisiana and Mississippi for both maintenance and construction purposes, Meredith said. Counties, municipalities and small paving contractors are good customers.

A typical batch of Radmix contains approximately 60% crushed shell (very fine particles passing the No. 80 sieve and dust salvaged from the crushing of

A crane with an 80-ft. boom and a 2-yd. clam bucket feeds aggregates to the three 150-ton hoppers of the asphalt plant. Radcliff produces both hot and cold mixes.

This apron-type feeder separately feeds and proportions the cold aggregates.



Radmix, Radcliff's hot-mix asphaltic concrete for cold application, is dumped into a railroad car. Radmix utilizes sharp river sand, crushed shells and fine bank-run sand.

coarse shells), 25% sharp river sand and 15% fine bank-run sand. The average asphalt content is 6%. The bituminous binder is 85-100 penetration asphalt cement.

In producing Radmix, an apron-type feeder separately feeds and accurately proportions the cold aggregates from the compartment hoppers (a Manitowoc 3000 crane with an 80-ft. boom and a 2-yd. clamshell bucket feeds the three 150-ton hoppers). Two rotary dryers in tandem, using high-pressure natural gas, complete drying of the aggregates. As they pass through the second dryer, the hot aggregates are cooled below the flash point of kerosene. The hot elevators take the aggregates to the top of the Cedarapids central batch-type plant where they are screened into three hot bins. Oversize coarse shells are returned from the overflow chute by way of an extended chute to a pulverator for crushing and rescreening.

After being proportioned in a weigh box, the aggregates are dumped into a 4,000-lb. twin-shaft pugmill where kerosene and asphalt cement are added after 15 seconds of dry mixing. After wet mixing for 60 seconds, the mix is dumped into trucks or flat-bottom gondola cars. Radmix can be stockpiled indefinitely. A thin crust quickly develops and guards the mix against heavy rains. Placement may be by hand, motor patrol or mechanical spreader. The liquefier evaporates during placement. Radmix yields about 22 square yards per inch of thickness per ton.

The plant has liquid asphalt storage tanks with a total capacity of 110,000 gallons. The asphalt, lime pumps and pugmill jackets are heated by one Childers automatic circulating oil heater.

When required, Radcliff makes uncrushed gravel and slag mixes.

Radcliff produces three high-strength base course materials. The most widely used is the straight reef shells as produced at the dredge. Applications include airfields, roads and parking areas. Reef shells stabilized with approximately 30% sand are used on navy airfields in the Mobile area, city streets and subdivisions. The third type is reef shells stabilized with 7 to 10% portland cement. It is used for quick base construction and over the poorer subgrade soils. The stabilized shells are produced in a pugmill and delivered to local jobs on trucks.

A sideline to the asphalt plant operation is the production of sand for sand blasting.

A 2-yd. shovel-loader is used for numerous tasks at the asphalt plant, including the maintenance of stockpiles and, occasionally, the loading of cars. A diesel locomotive pulls the cars on the five Gulf, Mobile & Ohio spur tracks leading into the plant.

Concrete Block Product

Radcliff's concrete blocks, known as Radstone, are marketed in south Alabama, south Misssissippi and northern Florida. The block plant setup includes a Besser block machine and two large and five small steam kilns with a capacity for curing 6,288 blocks (8 x 8 x 16) at one time.

The block machines are fed Enslite by two materials bins (80 tons capacity) and a 300-barrel cement bin. A stock-

Dry sand for sandblasting is loaded into a car at McDuffie Island for shipment to Pascagoula, Miss. When required, Radcliff produces uncrushed gravel and slag mixes.

pile of ½ million blocks is maintained, according to William Cochran, block plant superintendent.

Delivery of blocks is handled by trailer and flatbed trucks and, occasionally by barge. Blocks are handled by one Yale and two Towmotor lift trucks.

The process of crushing oyster shells into chicken feed for Southern Oyster Shell Milling's customers begins at McDuffie Island, where the 54-B's unload the shells over a 200-ft. long recovery tunnel. Two 30-in. belts carry the shells to a series of screens (Tyler and Simplicity) and crushers. Southern Oyster Shell Milling's final product, a minus ⅝ plus 8, U. S. Standard sieve, goes directly to a Continental gin conveyor loader and is loaded on barges for shipment to the main bagging plant on Mobile's Industrial Canal. Some of it is stockpiled for shipment to the Baltimore plant in cargo ships. All of the fines are accumulated into a 78-in. Akins classifier, dewatered and sent on a 30-in. belt 200 feet to a barge for shipment to the Ideal Cement Corp.

Bag Chicken Feed

At the bagging plant, the precrushed shells are unloaded into two 1,050-ton bins by a stiff-leg crane. The shells are conveyed by belts into a drier. A gravity-operated bucket elevator carries the shells to a series of six sets of vibrating screens, where they are classified into hen, pullet and chick size. The bagged feed—about 900 tons per day—is carried by conveyor to barges, freight cars or trucks.

Radcliff's concrete batch plant at McDuffie has a capacity of 75 yards an hour. Two bins formerly were charged by a crane; now the job is done by a 30-in. conveyor belt.

Southern Oyster Shell milling maintains a testing laboratory at McDuffie Island where its product is tested on 300 chickens. Herbert B. Harrison, plant superintendent, is in charge of testing.

Now, back to the actual dredging operations of Bay Towing & Dredging Co. *Excavating Engineer* selected a mild, cloudless day in March to visit the *Albatross*, which was dredging oyster shells six miles west of Fairhope in Mobile Bay.

The *Albatross*, Bay Towing's newest and finest dredge, is a 15-in. suction unit with a cutterhead and a 65-ft. ladder. It is 130 feet long, 43 feet wide and has a 10-ft. draft. It is powered by a GMC 12278A diesel engine, rated at 1,200 hp. It turns a 500-KW General Electric generator. A 250-hp Superior diesel, which turns a 200-KW General Electric generator, is the auxiliary unit.

The *Albatross* can load shells to barges on both its sides simultaneously. Its screening facilities enable the dredge to provide any combination of shells a customer desires.

Dredging usually starts at depths of between 11 to 15 feet and continues to 28 to 30 feet. Pumps deliver material to a two-tiered flat-screen washer (2 and ⅜-in. openings) on top of the dredge, where the process of satisfying the customer begins. The washing, screening and loading cycles are served by a system of 36-in. wide conveyor belts—two 150-ft. incline belts, two 78-ft. cross belts, two 87-ft. swinging belts and a small belt at the aft end to move material from the Eagle classifier to the incline belts.

Tug boats keep all dredges supplied with empty barges. They take loaded barges to McDuffie Island and other destinations.

All of Bay Towing's dredges work two 12-hour shifts. The men are on duty 10 days and off five. The *Albatross*, for instance, can bunk 46 men in its air-conditioned quarters.

Once each week for 12 hours, Capt. Tommy Blakeney, Bay Towing's young, curly-headed dredge superintendent, shuts down the *Albatross*, *Pelican* and *Shearwater* for repairs. The *Kingfisher*, *Shelldrake*, *No. 4*, *Flamingo* and *Gull* shut down once every two weeks. Eight

Continued on page 56

Crushed shells are bulldozed into position by an Allis-Chalmers HD-16 tractor. Radcliff's dry-type batch plant and two asphalt plants operate 8 to 10 hours a day.

Hawaii's Greatest Builder

Hawaiian Dredging & Construction Co., Ltd. has been literally building the Islands for 55 years. Great strides have been made to bring the Territory into ever increasing world importance.

MANY years before the Hawaiian Islands voluntarily joined territorial United States in 1898, the groundwork was laid for one of the largest construction firms in the Pacific. In 1865, Benjamin Franklin Dillingham, then first officer of a sailing ship, was left behind in Honolulu because of a broken leg he suffered there when he was thrown from a horse. The Massachusetts-born seaman took a liking to Hawaii, decided to stay and founded the dynasty bearing his name.

Among the major projects started by B. F. Dillingham, all of which were directed toward improvement of Hawaii, was the Oahu Railway and Land Co. Hawaii's only mainline railroad was constructed under this name. In 1893, the senior Dillingham's son, Walter F., joined the company as a railway clerk. With perhaps an even greater faith in the future of Hawaii than his father possessed, Walter Dillingham proceeded into enterprises outside of his father's realm.

Contracting Begun

In 1902, the Hawaiian Dredging Co. was founded, and today, as Hawaiian Dredging & Construction Co., it is the oldest general contracting firm in the Pacific area. By 1904, after his father became ill, 29-year-old Walter F. Dillingham was in charge of the Dillingham enterprises.

Principal purpose of the dredging firm was to provide added ports and wharf facilities in Honolulu and elsewhere in the Islands to meet the requirements of the rapidly-growing sugar industry.

The company traveled some difficult financial roads in the early stages of its growth, but as the years passed it became a firmly established enterprise entering into more and more dredging work for the government.

Big projects and small—the company took them in stride. For example, it was awarded a contract in 1903 for cutting

Draglines excavate a lagoon on site of Henry J. Kaiser hotel development in Waikiki. Rising up in background is Diamond Head.

A ½-yd. dragshovel clears a coconut grove on Waikiki for the Kaiser project. The firm has built some of Hawaii's finest hotels.

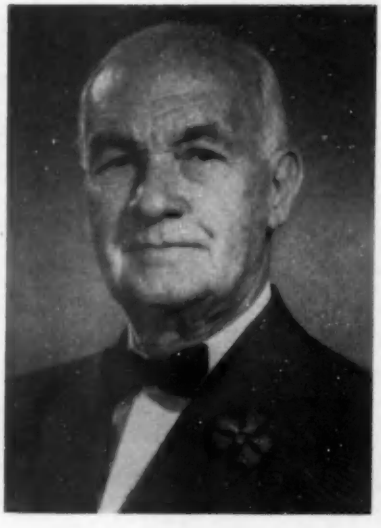
a channel through the sand and coral bars that blocked the entrance to Pearl Harbor. And, in 1908, the company dredged a five-mile channel into Pearl Harbor, later building many of the structures at the world-famous base, including the $5 million graving drydock No. 1, a repair basin that cost close to $2.8 million, and many piers and wharves. Recently it completed the gigantic Pier 2 shed at the entrance to Honolulu harbor, one of the finest in the Pacific.

Over the years the company has conducted an extensive program of land reclamation, and it is estimated that, since its establishment, it has removed some 122 million yards of dredged material. The firm has filled in more than 5,000 acres in Honolulu which are now some of the most valuable real estate in the city. The company's main office building on the Ala Moana in Honolulu is among many structures erected on land filled with material pumped from the nearby ocean.

Few of the really great builders of Hawaii claim such an imposing roster of completed projects: low-rental housing units, parks, roads, drains, sewers, hospitals, business buildings, hotels, flood control, gasoline tank farms, piers, structural steel sheds, power plants, pier sheds, airports, underwater crossings, channel and harbor deepening, sewage pumping stations, highways, yacht harbors, land reclamation and, of course, dredging of every type.

One of the major land projects was the Honolulu airport. This was a joint project with the Standard Dredging Corp. Some 1,875 acres of new land were created.

Another spectacular reclamation job was the filling in of Ala Moana park, the Ala Wai yacht harbor and the large Kalia tract. The park, once a city dumping ground, is now the largest in Honolulu, totalling 93 acres. Kalia tract includes areas on both sides of Kapiolani Boulevard, downtown Honolulu's largest and most important thoroughfare, known today as the "Miracle Mile." The boulevard is now built up on both sides with modern structures that house many lines of businesses. New land created for the tract amounted to 322 acres.



Walter F. Dillingham, 82, is chairman of the board of the firm which has done $1.6 billion business since he founded it.

Recently the company handled the dredging of a channel along the face of Ala Moana park and a program of beach improvement. The *C. F. Weeber*, a 4-yd. Bucyrus-Erie clamshell dredge with 75-ft. boom, excavated a channel 3,000 feet long and 20 feet deep along the beach for small craft. At the same time, the shore was developed and graded into one of Hawaii's finest beach areas. The job involved 200,000 yards of dredging.

Another 2,000-ft. channel was also dredged from the Ala Wai yacht harbor out to the sea. The passageway was widened to 200 feet with a depth of 16 to 20 feet. This phase required 106,263 yards of dredging.

Currently the Hawaiian Dredging & Construction Co. is expanding its operations to the West. Besides a joint venture project in Subic Bay in the Philippines for the Navy, the company has also contracted for work on Guam and Johnston islands and recently completed a dredging job for the Navy in Japan. The company was recently sponsor of a joint venture organization, Hawaiian-Bechtel, on the new Hawaiian Electric Co. 50,000-KW power plant.

The years just prior to and during World War II were busy ones for the company. In 1939, it entered into a

joint venture with two eastern United States contracting firms to construct naval air bases in the Pacific area—at Kaneohe and Ford Island on Oahu, and Palmyra, Johnston and Midway. This joint venture was later expanded so that eventually there were eight contracting members who worked at a total of 28 places in the Pacific from Oxnard, Calif., to Manila.

Largest Single Contract

Admiral Ben Moreell, organizer and commander of the Navy Seabees, was quoted as saying in 1946 that this contract, which originally started with an estimated volume of slightly less than $15 million and later grew to involve more than $1.125 billion in construction "is the greatest single construction contract in the history of the world in point of money value, diversity of character and dispersion over vast distances. It is, without question, the greatest single construction contract with respect to its effect on the security of this nation."

Dredging and land reclamation have kept the company busy, but it has found time to play an important part in building construction throughout the territory. Some of its major buildings are the SurfRider hotel, Honolulu Academy of Arts, Maluhia hospital, Oahu Transport Co. office building, the Federal building and the main bank of Hawaii building and its branches at Waikiki, Waipahu, Kaimuki, Kaneohe, Wahiawa and Kahului, Maui.

It also built the $2 million bulk sugar facilities at Pier 19, the Pier 2 shed, the Standard Oil Co. of California plant at Iwilei, the Hart Street sewer-pumping plant and the coast guard barracks at Upolu Point.

Pier 2, built by the Dillingham firm at the entrance to Honolulu harbor, is one of the largest and most modern in the Pacific. Famed Aloha tower appears at upper left.

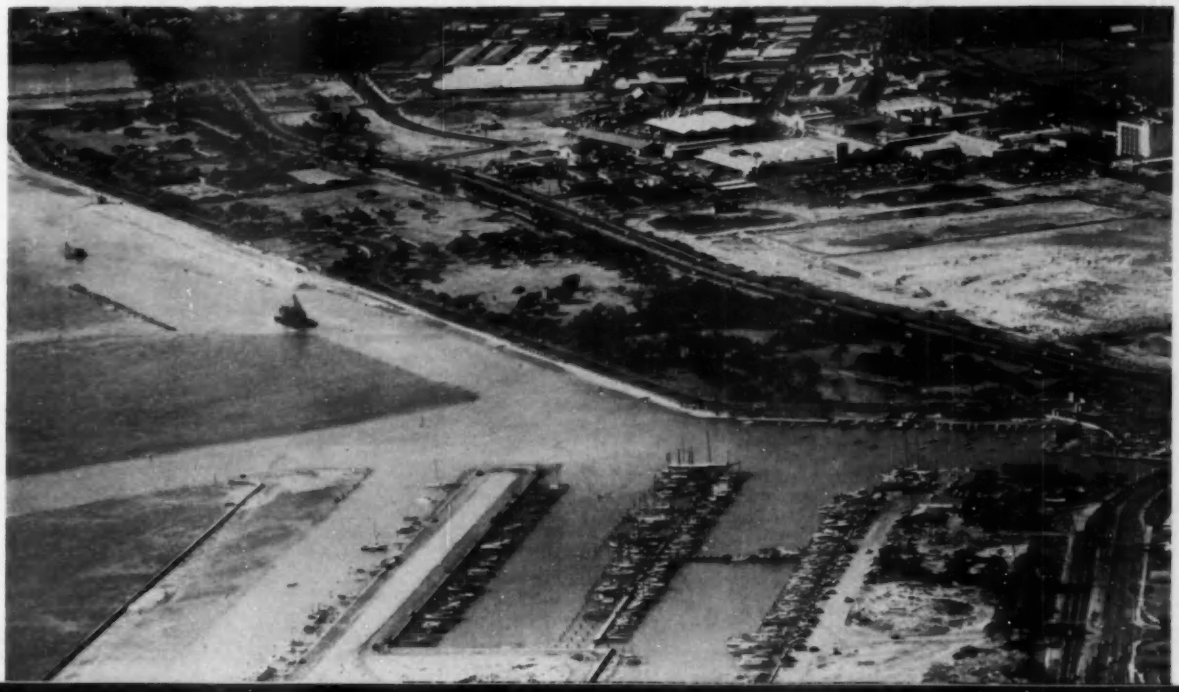
Drydock No. 1 at Pearl Harbor was built by the company alone, and Drydocks 2, 3 and 4 in joint venture with the Pacific Bridge Co.

At the end of 1956, the total construction volume done by Hawaiian Dredging & Construction Co., was $1-661,936,092.

The Dillingham tradition is destined to carry on in perhaps an ever greater role in the Hawaiian scheme of building and industry with W. F. Dillingham's sons, Lowell, who is now president of the Hawaiian Dredging & Construction Co., and Benjamin, who is now vice president and manager of the Oahu Railway and Land Co.

These two companies helped their founder, W. F. Dillingham, celebrate his 82nd birthday a few months ago. They view with pride the building that has been accomplished since the day when Hawaiian Dredging Co. was founded. It has been 55 busy years of creating land, erecting buildings and installations and in many ways enhancing Hawaii's prestige as America's greatest territory.

Ala Wai yacht harbor, Ala Moana park and a portion of the Kalia tract shown here were built on land reclaimed from the ocean.



Earthfill Replaces San Diego Bridge

by Ray Day

Contractor utilizes available borrow material for building low-cost 700-ft. embankment.

A 68-ft. high earthfill, 700 feet long and containing 138,000 cubic yards of material, is replacing a 50-year-old steel bridge in San Diego, Calif. Use of shovel-loaded, truck-hauled earthfill as an economical substitute bridge reconstruction exemplifies what many a dirt mover knows: unit costs for excavation are still pretty much the same as they were 20 years ago. And because they are, extensive earthfills can often be economically used.

V. R. Dennis Construction Co., San Diego, has a contract for demolishing the old bridge structure and placing the new earthfill. The bridge is situated in the east central part of the city, not far from the new Wabash Freeway. Since Dennis is also working on a freeway contract near there for the city, 55,000 cubic yards of material was dug for the bridge-fill embankment from a deep cut in the free-way. Another 50,000 cubic yards came from highway excavation near Nile Street, and 33,000 cubic yards originated from a nearby borrow pit.

The replacement fill tops off with a crest width of 60 feet. A 40-ft. asphalt roadway is centered on this crest. The fill is being compacted to 90% modified AASHO density, with 95% density control in the upper two feet. The fill is equal in quality to many of the dams in the Southern California area. A 5 x 5-ft. reinforced-concrete box culvert, built by concrete foreman L. A. Baker, will carry drainage water through the embankment and down the wash.

Scrap Old Bridge

Demolition of the old bridge structure was handled by cutting it loose from the bottom, and then pulling it down with the help of dozers. Using Victor cutting equipment, several welders worked underneath the old structure to cut loose the steel bracing ties. The bridge had eight steel towers. These were hooked onto, one at a time, by a cable leading to the drawbars of Caterpillar D8 tractors. After the bridge structure had been dropped down into the gully by pulls from this equipment, the towers were salvaged for use in a new rock processing plant which Dennis is building near San Diego. The balance of the steel was also salvaged or sold as scrap.

When the salvage job was completed,

A 1½-yd. shovel loads fill to 7½-yd. International K-190 dump truck which shuttles between nearby borrow pit and bridge site.

Embankment rises as trucks dump loads which are spread, sprinkled and compacted. Fill will be 60 feet wide at top.

the reinforced concrete box culvert was built in preparation for the start of fill.

First earthmoving from the deep Wabash Freeway cut was done by a combination of dozers and rubber-tire tractor front-end loaders. The cut lay along an old road, and had a steep sidewall, so that it was possible to shove loose material off the top by dozers. Two Caterpillar D8's with U-type dozers were used to push the material over this edge. Two Michigan 175-A tractor loaders, stationed on the road below, scooped the material into dump trucks.

While the method turned out dirt at a good rate of production, it was somewhat costly. Four operators were required on the four pieces of equipment. Too, depreciation on four units had to be considered. Dennis soon decided to purchase a Bucyrus-Erie 38-B shovel, whose rapidly swinging dipper would accomplish the same amount of work at much lower cost. The 38-B completed the 55,000-cu. yd. Wabash Freeway cut to a total depth of 78 feet. It then mucked out approximately 50,000 cubic yards from the Nile Street cut, and moved over to a borrow pit where the remaining fill material was dug. The machine has a standard 1½-yd. dipper, and is powered by a Caterpillar D342 diesel engine which burns approximately 25 gallons of diesel fuel per day on average digging.

Of an average of ten trucks used on the project, eight are owned by Dennis. Four are International L-190's, rated at 7½ compacted cubic yards capacity. Four are Ford, GMC and Internationals with Fruehauf-Schonrock cable-dump trailers. They are rated at eight compacted cubic yards. Two rented 7-yd. dump trucks also are being used. The borrow pits are being worked by driving through past the shovel, or by backing in on a double-spotting arrangement. The 38-B digs consistently at the rate of between 1,600 and 1,800 cubic yards in eight hours.

The truck haul is through town on city streets, so care is used not to overfill the trucks. It reduces dirt spillage. After a 2½-mile haul, the trucks dump the material, which is then spread by dozer in 6-in. lifts on the fill. Because of the variety of materials, optimum moisture content ranges from 10 to 16% depending on whether the material is sandy or clayey. Additional water is added if necessary by a 2,500-gallon International-mounted water truck, which hauls from a city fire hydrant at the top of the old right abutment of the bridge. A Cat-drawn LeTourneau-Westinghouse sheepsfoot roller is being used for six passes to develop the required fill density.

According to city officials and engineers in charge, replacement of the half-century-old bridge by an earthfill will be much cheaper and will require far less maintenance in years to come than any other known present method.

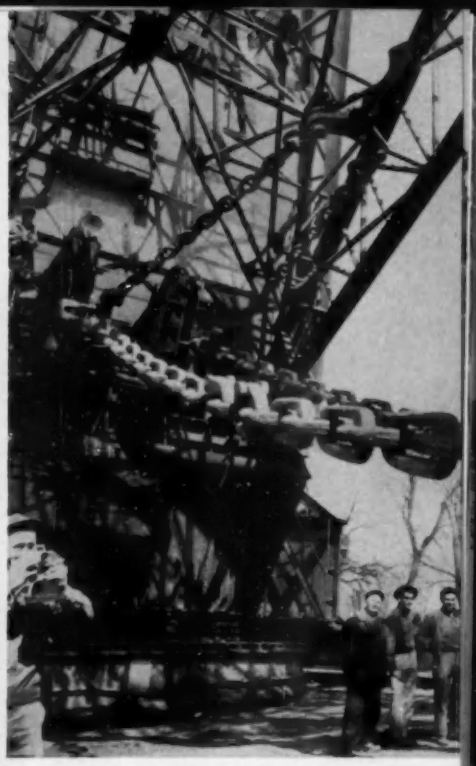
Supervising the project for Dennis is Chet Nelson, general superintendent, assisted by Elon Berkman, field superintendent, and Dan Comer, excavation foreman.

A LeTourneau-Westinghouse sheepsfoot roller drawn by a Cat D8 compacts a 6-in. deep lift of fill to 90% modified AASHO density. Moisture content is 10 to 16%.

High up on the boom, Superintendent Lloyd Bredvold relaxes as the 1150-B dragline nears the end of its journey. Streets and buildings shown here will be abandoned.

30-Yard Dragline Takes Long Walk to New Iron Mine

M. A. Hanna Co. moves 1150-B stripper from Morton pit about four miles across rough terrain to ghost town of old North Hibbing to begin multi-million yard mine stripping job.



MINNESOTA'S largest excavator completed a four-mile "walk" this spring to prepare to start digging another slice out of Hibbing.

The giant of the iron mining industry —a 1,200-ton dragline that moves in a walking fashion on two 8-ft. x 48-ft. shoes—completed its journey from the Morton mine to old North Hibbing, where homes, two schools, a courthouse and streets and sidewalks are being abandoned to clear the way for a new iron mine.

The mine eventually will become a part of the vast, Hull-Rust-Mahoning pit, reputed to be "the largest hole man ever dug," from which more than a half-billion tons of iron ore have been shipped since the beginning of mining there in 1895.

Looking somewhat like a prehistoric monster searching for a new feeding ground, the dragline—a Bucyrus-Erie 30-yd. 1150-B—traveled along a road built especially for the move—equivalent in width to a four-lane highway—to reach the site of an estimated 7 million tons of ore in the Norpac properties underlying North Hibbing.

It "walked" over dumps and railroad tracks and past the old St. Louis county courthouse, the village public library, the Washington elementary school now being torn down, and the Lincoln junior high school that closed permanently at the end of the recent term.

The move attracted hundreds of spectators familiar with the fame of the dragline and aware of its significance to the fate of North Hibbing.

Although a few private homes in the area still have not been purchased by the mining companies which will develop the properties—principally M. A. Hanna Co., owners of the huge dragline, and the Oliver Iron Mining Div., United States Steel Corp.—the community that once was the village of Hibbing is rapidly approaching its extinction.

Abandon Townsite

Abandonment of North Hibbing's remaining buildings will end a move started prior to World War I when a rich bed of iron ore was found to run underneath the village. The mines that later merged to form the Hull-Rust group began to encroach upon the community from three sides.

Moving operations reached their peak in 1918, when buildings were jacked up and carted away to the new village location two miles to the south. Some of the larger structures had to be cut into two or three sections.

Construction of Hibbing's present business district was started about the same time.

The beginning of the final phase of the movement came last year when Hibbing residents voted to permit the sale of all public facilities in North Hibbing to the mining companies. This allowed abandonment of streets, sidewalks, water and sewage lines, street lighting and public buildings.

The huge dragline was moved this spring to take advantage of the frozen ground needed to support its immense weight without extensive construction of a foundation in the roadbed for the temporary highway. Another reason for moving at that time was the fact that the only feasible path for heavy equipment was through mine properties lying between the Morton and Norpac.

(Left) Oiler Harold Buckwitz manipulates a big wrench on drag chain connection. (Below) Bucket uproots trees standing on mine property in path of machine.

To provide a smooth roadway for dragline and screening plant, thousands of yards of fill were borrowed from huge spoil piles.

The passage through those properties had to be completed before the busy activity of the ore season.

The move was a sizable task requiring help from dozens of men, two power shovels, seven 30-ton haulage trucks, six bulldozers, two cranes, three semi-trailer trucks and other assorted equipment.

Grading work began on the roadway on February 25. A 2½-yd. 54-B shovel and trucks and graders laid a 2-ft. roadbed of gravel along the route. A 6½-yd. 170-B shovel preceded the dragline much of the way, to slice a path through uneven terrain.

Build Large Fills

Thousands of yards of earth were hauled to build the roadbed over railroad tracks, hollows, ditches and hillsides.

Two fills required more than 25,000 yards of earth to build the path for the giant machine and its "entourage" that included a portable screening plant, stacker and trailing truss conveyor.

Steel wear plates ½-in. thick were welded to the bottom of the tub-like base of the dragline to protect it from excessive wear, and on March 6, the dragline and its 540-ton mobile screening plant started moving. Eight days later the stacker and trailing truss followed.

The dragline and screening plant moved under their own power. Current was transmitted through 2,700 feet of electric cable. Power source for the equipment had to be changed five times. A 3,000-KVA transformer, taken from the Morton substation and mounted on a trailer, was hooked into 23,000-volt lines along the route.

Telephone and power lines had to be temporarily cut to clear a path for the towering 180-ft. long boom of the dragline and for other machines that moved with it. Much of the moving had to be done at night when these wires could be cut with the least amount of service interruption. Although 18 days elapsed from the time the dragline left the Morton pit until it arrived at its destination, only 71 hours were spent actually moving the dragline.

The maze of lines, railroad tracks and access roads encountered required a time-table adjusted by the minute according to the speed of the dragline and the need to minimize inconvenience to other companies operating in the area. Robert Crist, Hibbing, general superintendent of the Mesabi Range for the M. A. Hanna Co., said cooperation from other mining companies and the village of Hibbing authorities was excellent, and eased the problems of the move.

Crowds that gathered to watch the moving operations stared in wonderment at the huge machines they were seeing close-up for the first time though they had viewed them before at a distance

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Electrical crew cuts a power line and prepares to hook up 3,000-KVA transformer mounted on low-bed trailer. Current was transmitted through 2,700 feet of cable.

At Warner Co.'s Cedar Hollow Quarry Big AUTOCARS Keep the Crusher Working to Capacity

Warner Co.'s Cedar Hollow Quarry, near Phoenixville, Pa., supplies better than 550,000 tons of stone a year. It's a big operation calling for big hauling equipment. On the haul from quarry face to crusher, Warner uses three Autocar units. Two are Autocar 6-wheel gasoline tractors pulling 17-ton-capacity side dump semitrailers. The other is a Diesel 10-wheel truck, with a 17-ton side dump body, pulling a 17-ton full trailer with side dump body. As the grade is only 4%, Warner hooks this additional 17-ton load onto the Autocar truck, hauls double the payload with only one power plant and one driver. Loads of 100,000 lb. are commonplace, and the three rigs are sufficient to keep the crusher at Cedar Hollow working to capacity.

The haul from crusher to stockpile is steeper—about 12%. Here two single-axle Autocars of 15-ton capacity, one with a diesel engine, one with a gasoline, operate on a fast trip cycle. Since they replaced three 10-ton trucks, they are effecting a considerable saving on the operation.

Warner Co.'s daily cost records supply convincing evidence that the extra power and stamina built into every Autocar is an investment in hauling economy. Whether it's a double payload or a single one with a quick turnaround, Autocars perform with outstanding dependability. The Warner fleet, now 2 years old, has required no major overhaul, only routine maintenance. The quality is there, applied with custom engineering. Get in touch with your White-Autocar distributor and find out how these great trucks can make your operation more profitable.

White Autocar

AUTOCAR TRUCKS

AUTOCAR DIVISION

The White Motor Company • Exton, Pa.

News from the Field

'Prestressed' Conference Set

Speakers at the World Conference on Prestressed Concrete at San Francisco, Calif., July 29-Aug. 2, will include two German engineer bridge builders.

Dr. Fritz Leonhardt of Stuttgart will outline his unique prestressed concrete construction methods for large and continuous bridge structures. Dr. Leonhardt has designed a number of great steel bridges such as the Cologne-Deutz bridge which spans the Rhine River.

The other German speaker will be Dr. W. Zerna, professor of concrete construction at Hanover Technical University. A noted bridge designer, Dr. Zerna is an outstanding researcher on the theory of elasticity and prestressed concrete.

Other speakers will include Wayne F. Palmer, designer of the long Lake Pontchartrain (La.) bridge, and Charles Peterson and A. H. Brownfield, state of California engineers who are prestressed concrete lift slab specialists.

The conference, sponsored by the University of California, will be attended by 150 engineers from 40 foreign nations. Total delegates will be about 900. The conference will be held concurrently with the third annual meeting of the Prestressed Concrete Institute.

Col. Eads Honored

Col. Edwin M. Eads, Air Force installations representative, South Pacific Region, recently was awarded the Newman Medal for 1956. The medal is awarded annually by The Society of American Military Engineers to an Air Force military or civilian engineer in recognition of the most outstanding achievement during the year in design, construction, administration, research and development connected with military engineering.

Col. Eads performed the surveillance of all Air Force design and construction in the South Pacific Region, which includes the states of California, Arizona, Utah and Nevada.

His military experience includes tours of duty in the guided missile development field at Holloman Air Force Base, N. M., and Patrick Air Force Base, Fla. In addition, he was the Air Force installations representative in charge of all Air Force construction in France.

"And that's the brake, huh?"

William E. Woodruff

William E. Woodruff, 49, manager of public relations for The Associated General Contractors of America and managing editor of *The Constructor*, official publication of the AGC, died May 2 from injuries suffered in an automobile accident a week before.

He had been public relations manager for the AGC since 1939. Previously, he had been a reporter for the old *Washington Herald* and *The Washington Post*.

Mr. Woodruff is survived by his wife, Mrs. Harriet Cranston Woodruff, and three daughters, Anna, 13; Helen, 11; and Harriet, 5.

Seaway Progress Satisfactory

Progress on construction of canals and channels of the St. Lawrence Seaway is satisfactory, the American Society of Civil Engineers was assured at its annual convention in Buffalo, N. Y., in June.

Seaway progress was outlined in a paper presented by William Grothaus, design engineer, St. Lawrence Seaway Development Corp., Massena, N. Y., and D. M. Ripley, senior hydraulic engineer, St. Lawrence Seaway Authority, Montreal, Que.

"Design of the Seaway canals and channels is virtually complete and construction is well advanced in all sections," the paper said. "Much work remains to be done to establish navigation aids and in chart compilation to make facilities fully useful to navigation. All this work will be completed in time, however, for the opening of the Seaway in the International Section in 1958 for vessels of 14-ft. draft and the whole of the Seaway for 27-ft. navigation in early 1959.

"In its upper and lower reaches from Ogdensburg, N. Y., and Prescott, Ont., to Lake Ontario, and from Montreal to the sea, the St. Lawrence River has been comparatively easy to navigate, and improvements for navigation have not been retarded by complex schemes or exorbitant expenditures. Rather, these reaches have been developed progressively over the years in step with the econo-

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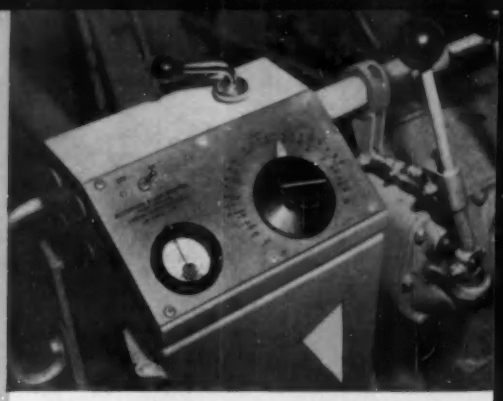
NEWEST REASON WHY THE CAT* NO. 12 MOTOR GRADER IS THE "STANDARD OF THE INDUSTRY"



Preco Automatic Blade Control is available only on the Cat No. 12 Motor Grader.

The Caterpillar No. 12 Motor Grader rightfully claims the title "standard of the industry." Yet Caterpillar is constantly seeking—and finding—ways to improve this great machine.

Latest advance is the Preco Automatic Blade Control, shown above, which keeps the blade at any desired slope, regardless of the roughness of the terrain. Accuracy in controlling slopes *within ⅛ inch in ten feet* has been demonstrated.

But this is only one more reason why the No. 12 is your best investment in a motor grader. Here are some of the others:

FAST, EASY BLADE POSITIONING: From ditching to bank cutting is a matter of seconds with Caterpillar's superior mechanical controls. Saves time and means a better job.

CAT DIESEL ENGINE: Time tested through 25 years of Diesel leadership. Clean, economical burning of non-premium fuels. Injection valves and pumps never require setting or adjusting.

EXCLUSIVE OIL CLUTCH: Rate of clutch wear has averaged less than the thickness of a human hair for 1,000 hours of operation. Clutch down time is therefore practically eliminated.

CONSTANT MESH TRANSMISSION: On-the-move shifting is easy and fast because large gears remain in mesh, do not have to be shifted.

MANEUVERABILITY: The No. 12 is unmatched in this department. Oscillating tandem drive makes backing across ditches easy. Leaning front wheels make turns shorter, steering easier.

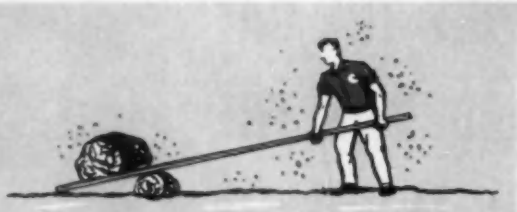
But these brief facts are only a hint of the Caterpillar No. 12's superiority. Get the full details from your Caterpillar Dealer. You can always count on him for fast, dependable service and quality replacement parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

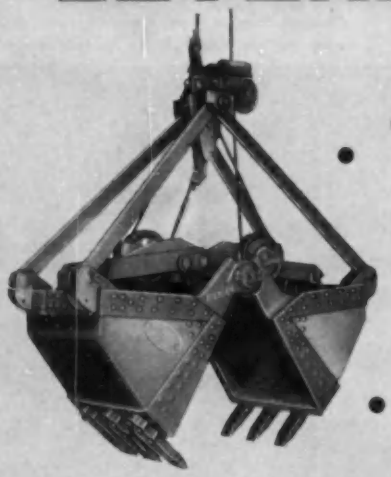
*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—
THE HARD WORK



KIESLER
LEVERAGE

WHERE IT COUNTS



THE KIESLER MIGHTY ICE TONG PRINCIPLE

Whether you are moving heavy rocks or operating a clam shell bucket, leverage . . . applied correctly . . . is highly important to you. For only with correctly-applied leverage can you expect to get the job done.

That the KIESLER bucket does get the job done is no idle claim: the KIESLER bucket DIGS DEEPER and DUMPS FASTER than any other bucket known!

IT DIGS DEEPER . . . because leverage is applied through two lever arms. Thus, power is EQUALLY exerted to BOTH SHELLS. This digging force, unequalled by any other bucket, is accomplished without unnecessary parts to the line, with less cable, and without extra dead weight.

IT DUMPS FASTER . . . because of the exclusive shell design which, besides providing for a full load, provides for dumping the instant the jaws start to open (not only when they are wide open). This positive dumping angle thus affords the operator spot dumping, avoiding spillage. Handling costs are reduced to a minimum.

DEEPER DIGGING . . . FASTER DUMPING . . . CONSISTENT PERFORMANCE . . . TROUBLE-FREE MAINTENANCE . . . that is the story of the KIESLER CLAM SHELL BUCKET. Phone or write today to learn how a KIESLER bucket can save you time and money in your rehandling jobs.

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.
Since 1892

944 W. HURON ST. • CHICAGO 22, ILL. • MOnroe 6-7144

News . . .

Continued from page 38

mies of the shipping for which they are particularly adapted. Consequently, the work involved in bringing these reaches into phase with the present project is not difficult and is required only from Ogdensburg to Lake Ontario and at the Welland Ship Canal."

Three engineers co-authored a paper on *The St. Lawrence—Planning and Construction Progress*. They were Lawrence H. Burpee, deputy chief engineer, St. Lawrence Seaway Authority, Montreal; Almern F. Griffin, special engineering consultant, North Central District, Corps of Engineers, Chicago, Ill.; and Lester W. Angell, assistant chief engineer, St. Lawrence Seaway Development Corp., Massena, N. Y.

They reported that the status of major contracts by Canada on March 31, 1957, was as follows:

Lachine Canal and dike work, 70% completed; St. Lambert Lock, 30%; Cote Ste. Catherine Lock, 40%; raising Jacques Cartier Bridge, 10%; Lower Beauharnois Lock and approaches, 25%; Upper Beauharnois Lock and approaches, 20%; highway tunnel, 80%; Lake St. Francis and Cornwall Island Channels, 25%; high-level bridge-substructure, 15%; Iroquois Canal and lock, 75%; Welland Canal, 25%.

Status of major United States projects on March 31, 1957:

Excavation, upstream portion, Long Sault Canal, 95%; excavation, mainland portion, Long Sault Canal, 50%; excavation, Eisenhower Lock, 90%; excavation, Grasse River Lock, 100%; Eisenhower Lock construction, 40%; Grasse River Lock construction, 35%; East-West Highway, Stage 1, 100%; Thousand Islands dredging, stage 1, 25%; operations building, 5%.

Interstate Map Available

A 22 x 34-in. wall map showing the national routes in the Interstate Highway System is available free from the LeTourneau-Westinghouse Company's distributor organizations. The map, which is printed in four colors on heavy paper stock, includes a chart forecasting highway spending by the states through 1959.

Written requests for the map should be addressed "Highway Program Map" and sent either to a local distributor or to LeTourneau-Westinghouse Co., Dept. 085, Peoria, Ill.

WHYTE STRAND

wire ropes are made to meet the needs of today's high output machines. There is a WHYTE STRAND wire rope in the correct size and construction for each use on all your machines. These Macwhyte ropes are PREformed for maximum flexibility, internally lubricated for super service, and stocked for immediate delivery.

Don't guess at the correct specification of wire rope for your machines. Ask for "Correct Wire Rope" Bulletin No. 5702.

MACWHYTE COMPANY
2906 Fourteenth Avenue, Kenosha, Wisconsin
Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: **New York 4,** 35 Water St. • **Pittsburgh 36,** 353 Old Curry Hollow Road • **Detroit 3,** 75 Oakman Blvd. **Chicago 6,** 228 S. Desplaines St. • **St. Paul 14,** 2356 Hampden Ave. • **Ft. Worth 1,** P.O. Box 605 • **Portland 9,** 1603 N.W. 14th Ave. • **Seattle 4,** 87 Holgate St. • **San Francisco 7,** 188 King St. **Los Angeles 21,** 2035 Sacramento St.

1120-C

Equipment You Ought to Know About

Four Wheel Drive Tractor

Manufacturer: M-R-S Mfg. Co., Flora, Miss.

Claims: A four-wheel drive version of the 335-hp M-R-S 200 tractor is now available. Designed for hauling over pioneer-type terrain, the driving front axle combines a high degree of mobility with the great traction made possible by hydraulic weight transfer for negotiating extremely rough or spongy hauling surfaces.

With ample power, a static weight of 45,500 pounds and large, low-pressure tires, the big tractor is capable of providing up to 38,200 pounds available tractive effort. An optional differential ratio is available, providing a maximum available tractive effort of 44,100 pounds. A semi-automatic transmission is employed, giving the tractor nine forward and two reverse speeds with maximum forward speed of 35.18 mph.

The model 200 four-wheel drive tractor is recommended as a prime mover to self-load scrapers up to 20 cubic yards struck capacity and for powering scrapers up to 30 cubic yards struck or 39 cubic yards heaped capacity when loaded with pusher assistance. Available for use with the tractor are 30-yd. struck capacity rear dump rock wagons and 35-yd. struck capacity bottom dump wagons. An adjustable tilt and pitch bulldozer is also available.

Contractors School

NAME .....

ADDRESS .....

CITY .....

Learn how to figure labor, material costs on construction jobs. Write for 30 day free trial. CONTRACTOR'S SCHOOL, Box 12, Dallas, Tex.

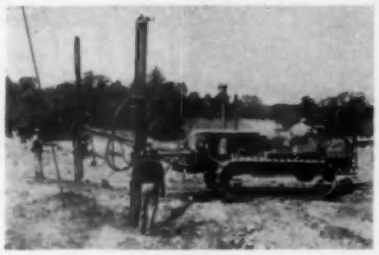
"Well, if it isn't Will Johnson! Remember me, Gabby Smith? Let's see, the last time I saw you was on the Ell River dam job. R'member how . . . . . "

Brush Root Rake

Manufacturer: Rockland Allied Equipment Co., 3778 W. Colonial Dr., Orlando, Fla.

Claims: Rockland is producing the lightweight BRR brush and root rake for clearing and piling of brush, roots and small trees. The BRR rake is manufactured for all sizes of crawler-type tractors and can be purchased through many Allis-Chalmers, International-Harvester, Oliver and TerraTrac dealers, according to Rockland.

Tractor-Mounted Drill



Manufacturer: Worthington Corp., Harrison, N. J.

Claims: Worthington has introduced a new Blue Brute tractor-mounted drilling rig for production blast hole drilling on rock excavation projects, quarrying, ditching and open-pit mining.

The Blue Brute drilling rig is a completely self-contained unit carrying its own air supply and driven either by the tractor engine or a cross-mounted portable.

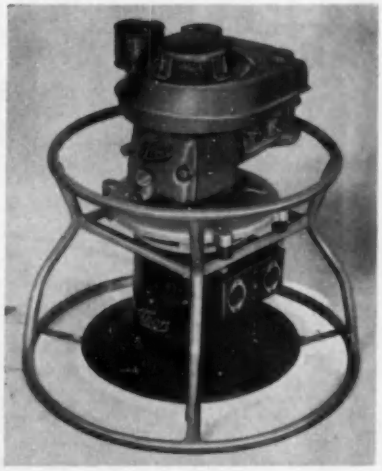
The two hydraulically controlled jibs can be operated through a total arc of 100° vertically or horizontally. The boom can be extended for any distance up to five feet, providing a large drilling area and making it possible for more blast holes to be drilled from one location than conventional equipment which must be located after each blast hole is drilled.

Special features include the standard Blue Brute UM-40 chain feed and drifter assembly for fast drilling, low air consumption and economical performance; exclusive positive, long-wearing, oversize hydraulically-operated clutch between compressor and tractor PTO; and simple, positive-locking hydraulic controls to maintain effectively the position of drill.

Portable Generators

Manufacturer: Thor Power Tool Co., 175 No. State St., Aurora, Ill.

Claims: Thor has marketed two new portable electric generators. They are 1,500-watt models featuring a revolutionary vertical shaft design. With the



vertical shaft, the entire weight of the generator is supported by tubular framework. Weight loads normally imposed on the main bearing shaft in conventional horizontal designs are shifted completely to the framework.

Since the engine main bearing and shaft only has to turn the armature—not support it as well—longer life and more efficient service can be expected. A further advantage is simple shock mounting which isolates the rotating armature action and engine vibration from the frame. The entire assembly floats in the framework that serves also as protective guard and carrying handle.

Powered by gasoline engines, the two models—EG-1.5A for alternating cur-

rent and EG-1.5D for direct current—provide 13 amperes of 115-volt current for operation of electric drills, saws, hammers, concrete vibrators and other tools on construction sites.

Compact and easily portable, the generators weigh 95 pounds, are 23¾ inches high and 23 inches in diameter. Each has a four-cycle, single cylinder, air-cooled engine with automatic rewind starter. A toggle-type ignition switch eliminates shock danger and inconvenience of shorting straps. Two plug-in outlets are provided, and any number of tools or lights with a total power requirement up to 1,500 watts may be used simultaneously.

Cat Tractor, Scraper

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Caterpillar has announced a new four-wheel prime mover and matching scraper combination.

The new unit is the DN15 (Series E) tractor and the No. 428 Lowbowl scraper. The tractor has design changes in several major components, including the engine and power train. The matched scraper is designed to utilize the tractor's output in obtaining maximum production. It incorporates Lowbowl design to facilitate fast loading.

A new Caterpillar diesel engine has been designed for the DW15 (Series E). It develops 200 hp (maximum output) at 2,000 rpm. Features incorporated into the engine make use of natural engine lug characteristics to accomplish a 23% torque rise and high rim-pull over a wide speed range. This decreases the need for gear changes. As an example, in fourth gear over 3,000 pounds of rim-pull are delivered when the tractor is operating in the speed range between 9 and 18 mph.

The DW15 (Series E) incorporates a 10-speed transmission, offering working speeds from 2.7 to 37.2 mph. Top speed of the DW15 (Series E) is 14 mph faster than its predecessor model, the DW15 (Series C).

The major components of the drive train have been given additional strength for longer service life.

Wide-section, 26.5 x 25, 20-ply tube-

Continued on page 48

WORKERS RELY ON CROSBY CLIPS

THIMBLES INCREASE ROPE LIFE, SAFETY

Unless protected by a thimble, wire rope can be seriously damaged by heavy lifts that crush the strands at the load point. A light thimble can collapse and damage the rope. For positive rope protection and safety, specify Crosby Laughlin heavy plow steel thimbles with the extra heavy steel section design that stands up under maximum loads. Plow Steel Thimbles are available in sizes to fit ¼" to 2¼" wire rope. Stainless Steel Thimbles are offered in selected sizes.

Rigging a cable way 600 feet in the air demands the best fittings available to protect men and materials. This crew is assured of maximum safety because their work platform is secured with genuine Crosby* Clips. This clip, quickly identified by the "Red U-Bolt*" is the number one choice on every job where maximum safety and holding power is essential. Look for the red U-bolt—you'll see it securing wire rope in every industry! And Crosby is the *only clip* available in sizes to fit every rope from ⅛" to 3"! Proved design and quality controlled manufacture—finest steel, drop forged base, galvanized—results in consistently reliable performance.

From one source, Crosby Laughlin Lebus, you get the world's most complete line of fittings: Crosby Clips and "Load Rated" Blocks; Crosby-Laughlin drop forged shackles, hooks, Missing Links*, turnbuckles, thimbles, and other fittings; famous drop forged Lebus Loadbinders and drop forged Snatchblocks! Your Crosby Laughlin Lebus Distributor is your one stop fittings supplier—see him next time you need *any* fittings!

*REGISTERED TRADEMARK

World's Most Complete Line of Fittings For Wire Rope and Chain

CROSBY LAUGHLIN LEBUS

FORT WAYNE 1, INDIANA

BASIC HYDROCRANE DESIGN

The H-5 Hydrocrane pictured here is handling a concrete bucket during the restoration of State Capitol building at Nashville, Tennessee.

Builds Profits from Many Angles

The basic advantages you get from the all-hydraulic Hydrocrane design eliminates hundreds of parts necessary in ordinary cranes . . . gives you a compact, lightweight machine that costs less to operate and maintain.

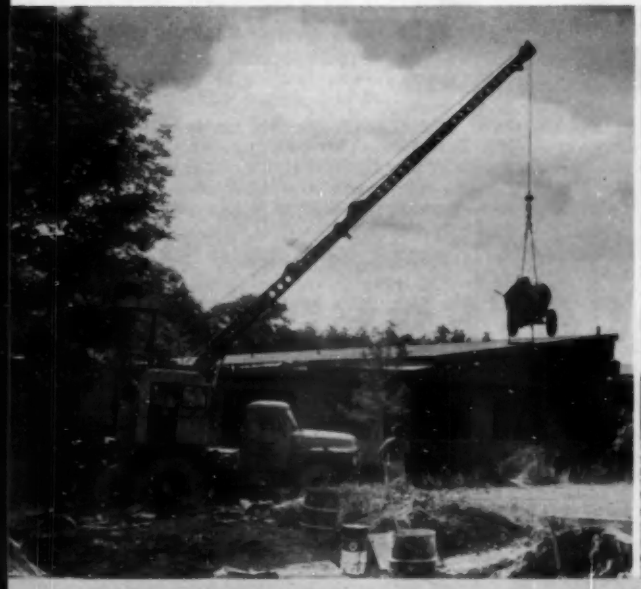
The Hydrocrane offers big capacity and unusual stability along with compactness, because strain and stresses of the working crane and its loads are supported by outriggers. These four steel legs extend, set and level the machine hydraulically.

With outriggers to carry the load, the Hydrocrane mounts on a conventional truck giving you the advantages of mobility, convenient corner-station servicing and standard-truck repair parts. In addition, you can save right at the start by buying a suitable, inexpensive used truck on which to mount your Hydrocrane.

Unmatched precision control lets you handle loads precisely; telescoping boom reaches out for extra jobs; working boom hoist changes boom angles while swinging . . . at the flick of a lever; and a selection of hydraulically operated attachments are money-making improvements over rope-reeved clamshells, grapples, hoes.

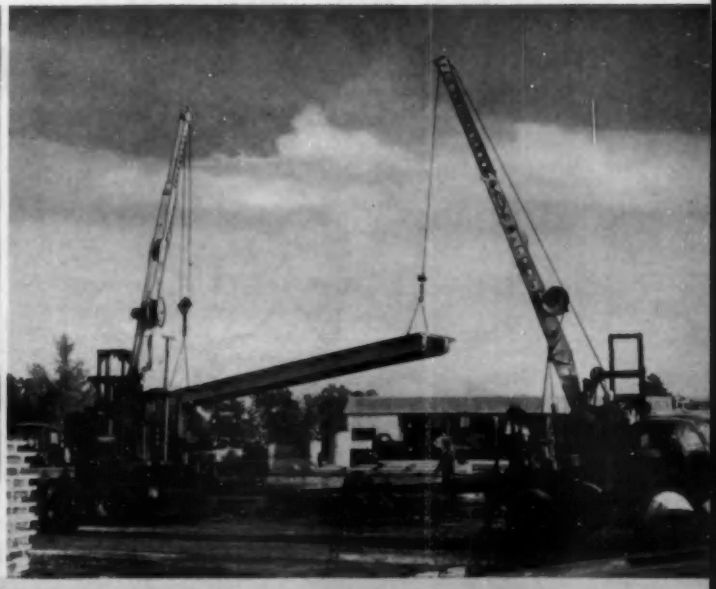
The Hydrocrane's basic design gives you a multi-job speedster that handles jobs ordinary cranes can't touch. Start earning extra returns on your truck-crane investment now. Get the complete profit story on the 5-ton H-3 or the 10-ton H-5 from your Bucyrus-Erie Hydrocrane distributor. 174H57C

BUCYRUS-ERIE COMPANY • South Milwaukee, Wis.

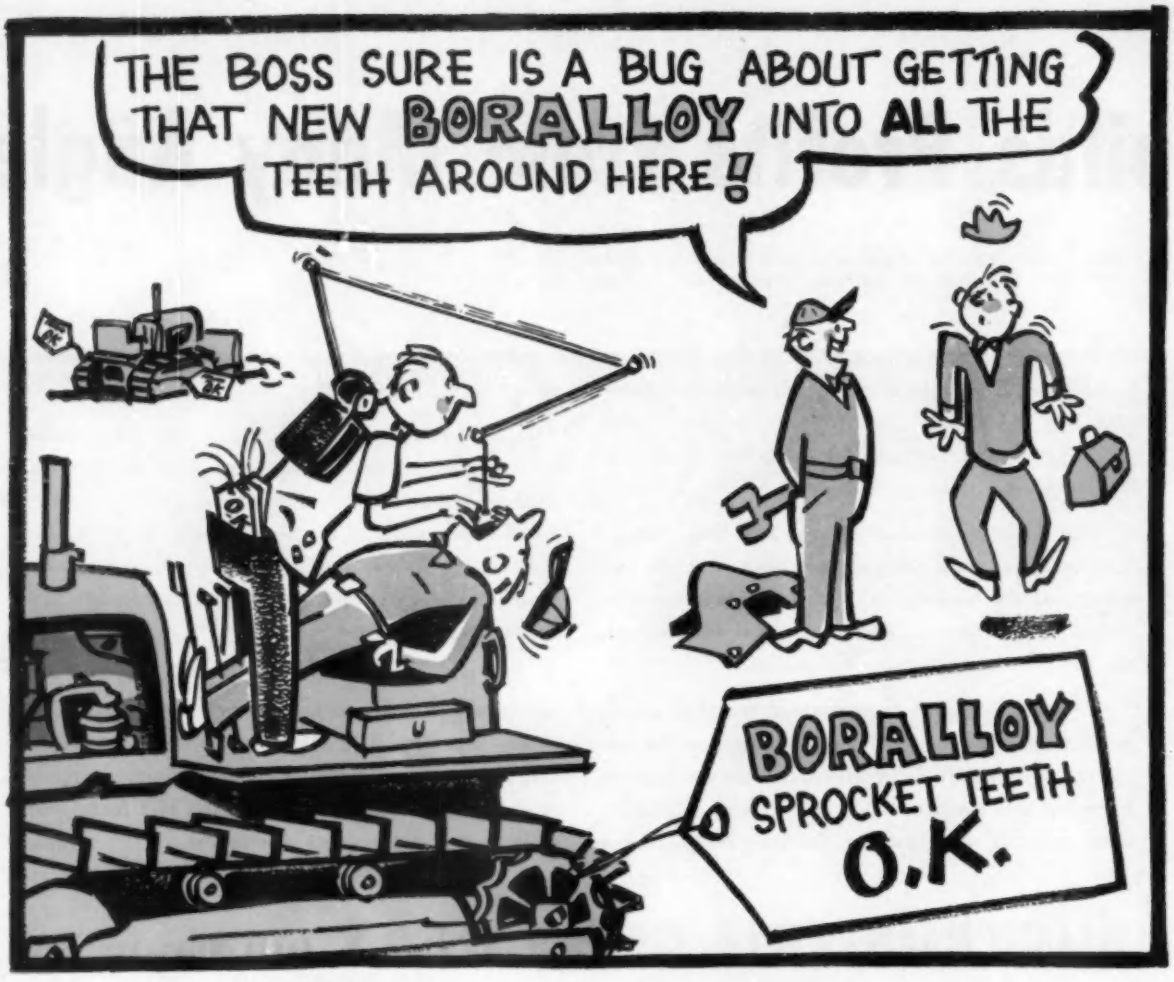


An H-3 Hydrocrane lifts a mixer to the precast slab roof prior to grouting. Note the value of outriggers to level crane on very rough ground.

BUCYRUS ERIE HYDROCRANE



An H-5 and an H-3 Hydrocrane team up to set a large precast concrete beam.



It increases sprocket life 50 to 100%! Got the name?—*Boralloy*. It's a new alloy which Caterpillar uses to make sprockets and replacement rims. It permits a minimum of 61% deeper hardening.

Result: CAT* BORALLOY sprocket teeth hold their contour longer. Teeth and track bushings *stay* in proper mesh, reducing wear and tear on all track running gear. Don't take chances. Get parts you can trust — see your Caterpillar Dealer today! Where else can you get the long-life benefits of Boralloy?

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NOT in the Contract

A young man and a young woman reported to the circus for a tryout as lion tamer. The man went into the lion cage first. He was quite successful with all the animals except Duke, a young, fierce, heavily maned creature. Duke would not perform for him so he came out.

The young lady, clad in a bikini-like costume, then entered the cage. After a few cajoling phrases Duke grovelled on the floor, crept meekly to her feet, patted her gently with his paw, ran his tongue out about a foot and kissed her on the chin.

The circus owner said to the young man, "Why can't you put on an act like that?"

Replied the young man, "I can, if you'll get those doggone lions out of there."

"Is he the sort of fellow who forgets you when you have no money?"

"No, he's an installment collector."

A wealthy businessman decided to go to church one Sunday. After services he approached the preacher with much enthusiasm. "Reverend, that was a damned good sermon you gave, damned good."

"I'm satisfied that you like it, but why use such terms in expressing yourself?"

"I can't help it, Reverend. I still think it was a damned good sermon. As a matter of fact, I was so impressed I put a hundred dollar bill in the collection basket."

"The hell you did!"

"Waiter," said a diner who had just sampled his dinner, "these veal chops don't seem very tender to me."

"Sir," replied the waiter, "I used to be a butcher, and I can tell you that less than a month ago those chops were chasing after a cow."

"That may be," replied the man, "but not for milk."

Little, demure Helen Hunt found a wallet containing $20. Being as honest as she was pretty, she reported her find to the local newspaper. They ran an ad reading—"The party who lost a wallet containing $20 can go to Helen Hunt for it."

Judge to Joshua (who had been picked up on suspicion): "Are you the Joshua who made the sun stand still?"

Joshua: "No sir, your honor, I'm the Joshua who made the moonshine still."

The country agricultural agent sat in his office and, when the phone rang he picked it up with a cheery "Hello."

A woman's voice answered:

"Say, I have a flock of chickens, and I want to know if I put a rooster in with my hens how long it will be before I can expect to get fertile eggs."

"Just a minute," said the courteous farm advisor, as he reached across the desk to get the pamphlet which might have the vital information.

"Thank you," replied the lady, as she hung up.

The aged mourner slowly limped to the bier and for a long time stood there staring at the face of his departed friend. The funeral director approached him. "How old are you, sir?" he said.

"I'm 98," came the whispered reply.

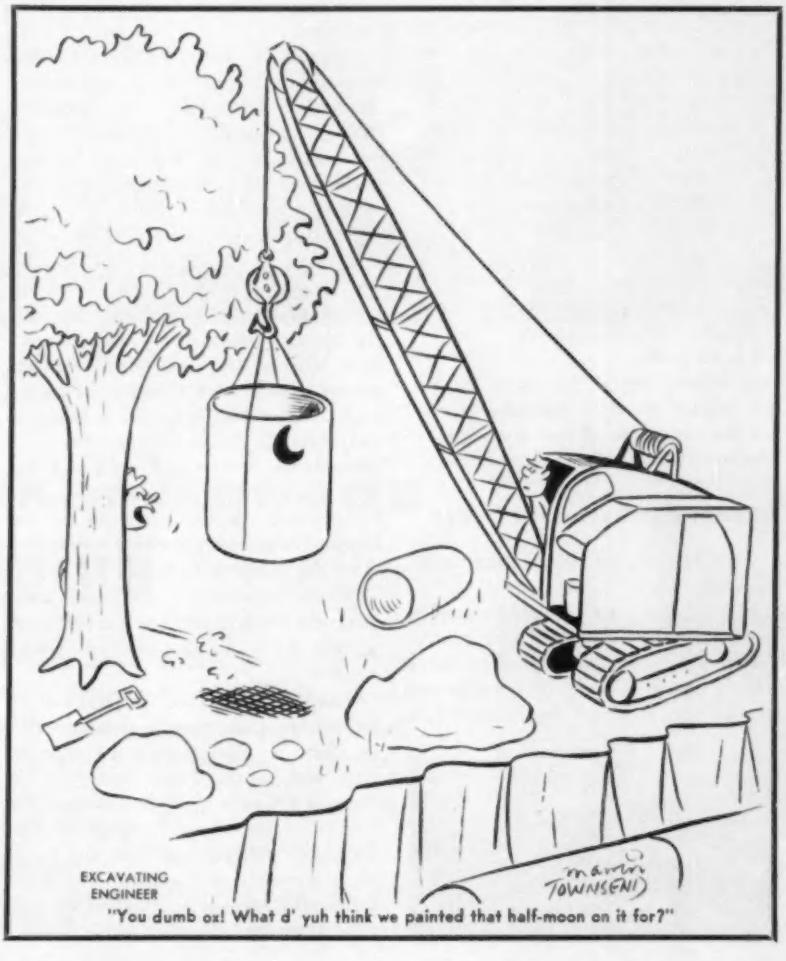
"Holding him by the arm, the funeral director asked, "Hardly worth going home, is it?"

Blondie: "I enjoyed the opera last night with Bill; he had the most powerful binoculars."

Brunettie: "I'd love to meet him. I just love those strong virile men."

Two stuttering blacksmiths had finished heating a piece of steel and one placed it on the anvil. "Hhhhhhit it," he stated to his helper. "Wwwwwhere?" he was asked. "Aw, hhhhhhhhell, we'll have to heat it again now."

There was a Scotsman who wouldn't buy his girl a parasol when they went to the beach, but told her shady stories instead.



"You dumb ox! What d' yuh think we painted that half-moon on it for?"

Mobile Office units are always ready to go to work for you wherever the job—no shack to erect and then tear down—no time lost in looking for records, blueprints, etc. Everything is at your fingertips—where you want it, when you want it.

Mobile Office units are built for years of rugged use. Mobile Office units offer ideal facilities for Offices, Drafting Rooms, Paymasters, Timekeepers, Engineers and and many other uses conforming to the contractor's particular needs.

Write today and get the complete facts on how Mobile Office units can work for you.

MOBILE OFFICE INCORPORATED
7300 Stony Island Avenue, Chicago 49, Illinois
Phones DOrchester 3-1048-9

New Equipment . . .

Continued from page 43

less tires are being offered as standard equipment. Rear wheel tread has been increased by nine inches over that on the previous model.

The braking system also has undergone changes. Brake shoes with solid cam ends are now used. Improved linings with longer rivets have been adopted.

The No. 428 scraper has a struck capacity of 13 cubic yards, an increase of 4.1 yards over its predecessor, the No. 15 scraper. Heaped capacity of the No. 428 is 18 yards.

Additional design features of the No. 428 include increased ground clearance and an apron lift of increased height. The pushblock also has been modified.

Removable Gooseneck Trailer

Manufacturer: LaCrosse Trailer Corp., LaCrosse, Wis.

Claims: LaCrosse has introduced a heavy-duty low bed trailer with removable gooseneck that permits one man to unload heavy construction equipment quickly and easily off the front end in congested areas. The complicated hydraulic or cable lifts ordinarily used on removable gooseneck trailers have been eliminated.

Instead, the trailer bed is raised and lowered by means of a ramp mounted on the rear of the tractor. Two standard fifth-wheel couplings—one on the tractor and one on the front deck of the trailer—are used to attach the gooseneck to trailer and tractor.

For unloading, the front of the trailer is lowered directly to the ground (16-in. loading height) by releasing the tractor fifth-wheel and slowly driving the tractor forward. Two hinged gooseneck stirrups are then raised and the tractor again is backed under the gooseneck. The tractor king pin is relocked and, after the trailer king pin has been released, the tractor and gooseneck are driven forward so that equipment can be unloaded off the front-end of the trailer. The reverse procedure is followed after the trailer is reloaded.

Winch assistance is necessary only when the tractive effort is not sufficient to raise the trailer and load into travel position.

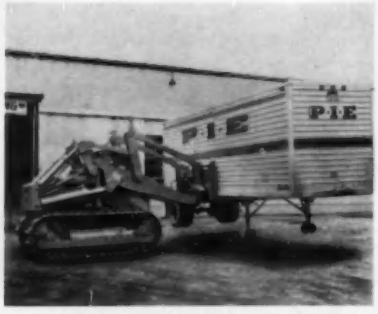
The new trailers are available in 25 to 50-ton capacities, with tandem walking-beam or spring-mounted running gear, and up to 75-ton capacity with the new LaCrosse triple-axle design. The company also offers a choice of flat, drop-side or beam-deck types and a pair of 4-ft. skids is included with each trailer for loading shovels, rollers and pavers, among other things.

Heavy-Duty Fork Lift

Manufacturer: Eimco Corp., 364 S. 4th West St., Salt Lake City, Utah.

Claims: Eimco has introduced a new heavy-duty fork lift featuring hydraulically-operated four-way tilting and leveling. The unit is mounted on a 143-hp crawler tractor equipped with torque-converter.

Capable of lifting 15,000 pounds to a full reach height of 14 feet, the machine is held suitable for many applica-



tions requiring reach, high power and maneuverability. It is produced as an attachment for the Eimco 105 tractor.

For maximum visibility and greater work control, the fork lift seats the operator at the front of the machine. Uni-drive transmission with independent track reversal for spin turns, gives the fork lift versatility and operating ease even under close working conditions.

The fork lift is interchangeable with the front-end loader attachment and is designed to provide a unit flexible enough to meet materials handling jobs on uneven or sloping ground as easily as in prepared storage areas.

Hydraulic Loader

Manufacturer: Seaboard Equipment Co., Inc., 7 Hanover St., New York 5, N.Y.

Claims: The new Merton Two-Way loader is a diesel-powered hydraulic loading shovel with 7/8-yd. bucket capacity. Mounted on rubber, it can travel at speeds up to 13½ mph. It discharges

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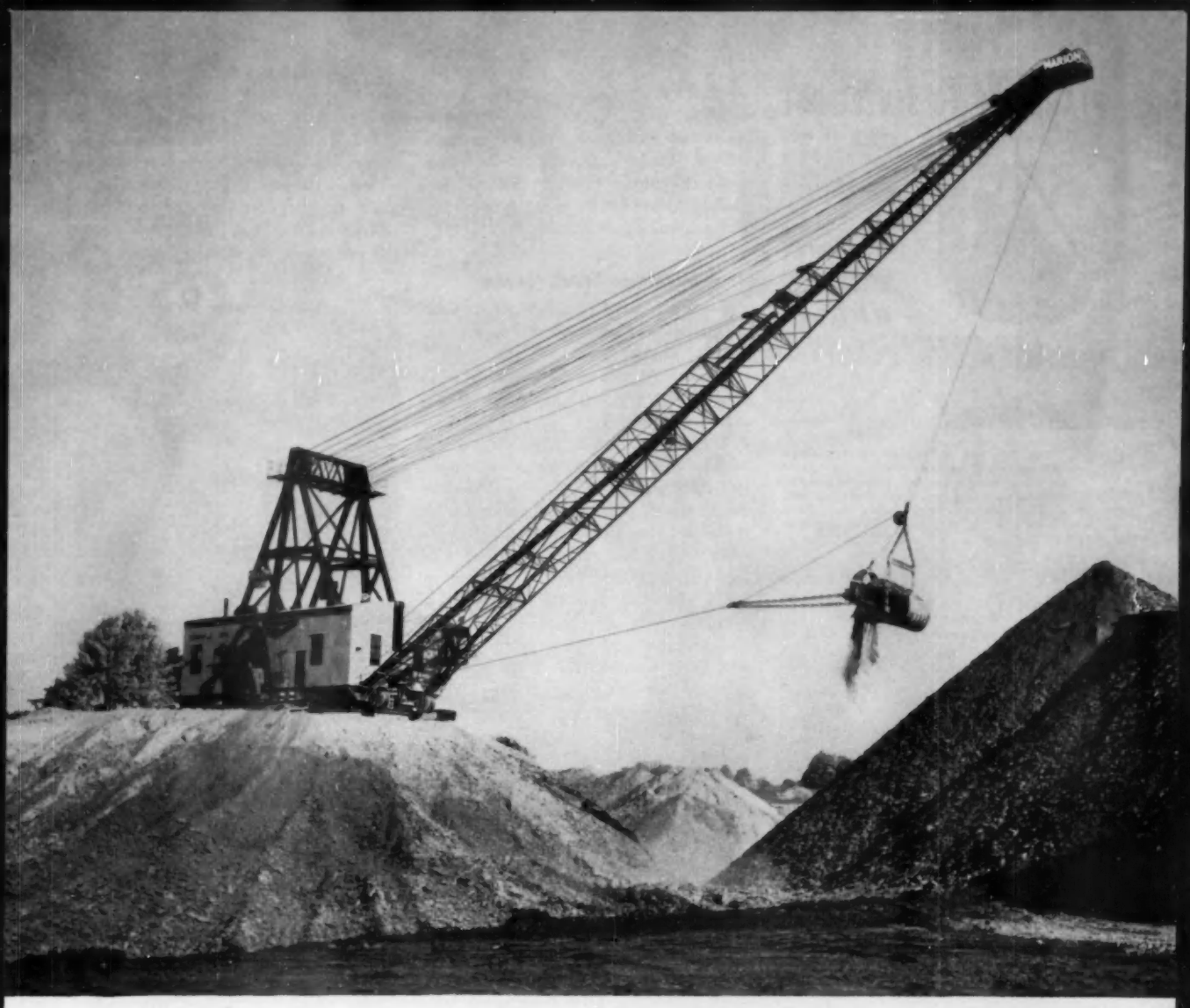


Modern Walker Speeds Strip Mining

Efficient, up-to-date equipment makes coal strip mining profitable. This Marion Type 7400 walking dragline works a double cut, uncovering two seams at a large-scale operation in southeastern Ohio. This big dragline's 175-foot boom carries a 13 cubic yard bucket.

Marion 43-M equipped with 1¼ yard dragline bucket on 60-foot boom. Ask for information about Marion machines to fit your size and front-end requirements.

CONSULT MARION *MINING SPECIALISTS for lower costs on your property!*

MARION POWER SHOVEL COMPANY—MARION, OHIO, U. S. A.

STANDS UP TO SEVERE USE

and

even

abuse

One word describes a Hayward — *ruggedness.* Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

GLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

New Equipment . . .

Continued from page 48

its bucket at the front or over the rear, and provides straight line loading from stockpile to discharge point to afford full mobility and penetration without conventional turning and pivoting.

Discharge at both front and rear is fully controlled and the height of the discharge can be varied from ground level to 9 feet in front, and from 4 feet 10 inches to 9 inches at the rear. Only two pairs of double-acting hydraulic rams are used to control all bucket movements; the main lift rams incorporate an effective dampening device which automatically slows down the bucket as it travels over top-dead-center, greatly reducing the stresses on the ram packings and on the machine as a whole. Double-acting main rams provide positive down digging pressure and will move the bucket down to 16 inches below ground level. Fingertip operated bucket hoisting, braking and travel control are completely independent of master clutch.

The ⅞-yd. bucket and a 24-second operating cycle give the Merton loader an output of approximately 100 cubic yards per hour.

The equipment is strongly constructed, and all components of the hydraulic linkage are precision machined. The main frames are bored in line. A fully-enclosed operator's cab with large safety glass windows provides maximum visibility and protection. Optional equipment includes hydraulic steering; 1¼-yd. bucket; bucket teeth; tow hook; rear power take-off; 6-ft. 11-in. wide bulldozer blade; and 1,500-lb. capacity crane attachment.

Michigan Truck Crane

Manufacturer: Clark Equipment Co., Construction Machinery Div., Benton Harbor, Mich.

Claims: A redesigned truck is now available for the Michigan Model T-20 excavator-crane.

The truck-crane package has a gross vehicle weight of 42,300 pounds with full crane equipment, which can be reduced to 37,600 pounds for highway travel by removing rear outriggers, crane boom and counterweights. For steel erection the T-20's maximum boom length is now 80 feet with jib booms 10 to 15 feet long.

The truck power train consists of a five-speed transmission, a two-speed transfer case and planetary wheel driving axles, which are Clark-designed and built. With a 134-hp gasoline chassis engine, the maximum travel speed is 35 mph. Ease and safety of operation is provided by hydraulic steering booster and all-wheel air brakes.

All-wheel 6 x 6 drive is standard equipment. Riding qualities have been improved through redesigned front axle overload springs. The truck chassis is of all-welded construction with 18-in., 58-lb. Man-ten steel channel frame rails.

Maintenance of the chassis engine has been made easier by extending the hood flush with the right forward side of the truck. A large side access door permits entry to the engine compartment even when the boom is extended forward in the carry position.

The crane's upper mechanism, increased from 62 to 75 bhp, has air-controlled shaft and drum clutches with power up and down on the load line. Air-controlled swing brake and worm gear boom hoist are standard equipment.

I-R Crawler Drill

Manufacturer: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Claims: A knee-action crawler rock drill, the Crawl-IR, has been introduced by Ingersoll-Rand. The Crawl-IR is mounted on crawler tracks driven by air motors. All boom and feed tower adjustments are hydraulically controlled.

Two hydraulic cylinders operate the boom, allowing it to swing in a horizontal arc of 85° and a vertical arc of 82°. Three other cylinders position the feed-tower for vertical, horizontal or angle drilling from any boom position. Hydraulically-operated horizontal boom-swing allows a maximum hole spacing of nearly 10 feet. Horizontal holes can be drilled from ground level to seven feet without moving the unit on its tracks. The boom itself is 5½ feet long and the feed tower is 15 feet high.

When spotting holes, centrally located finger-tip controls automatically position the feed tower. The entire operation of positioning and drilling can be done by one man.

Two air motors propel the machine. These are reversible and independently controlled for steering in any direction. A knee-action frame allows the drill to move over any type of terrain.

When moving into drilling position, the Crawl-IR can operate as far away from the compressor as the air hose will allow. When the job is finished, the drawbar of the compressor can be hooked to the drill, and the Crawl-IR will haul itself and the compressor to a new site.

65 belt hp!
up to 15,500 lb drawbar pull!
forward speeds from 1.5 to 5.5 mph!
reverse to 4.1 mph!

ALLIS-CHALMERS

HD-6

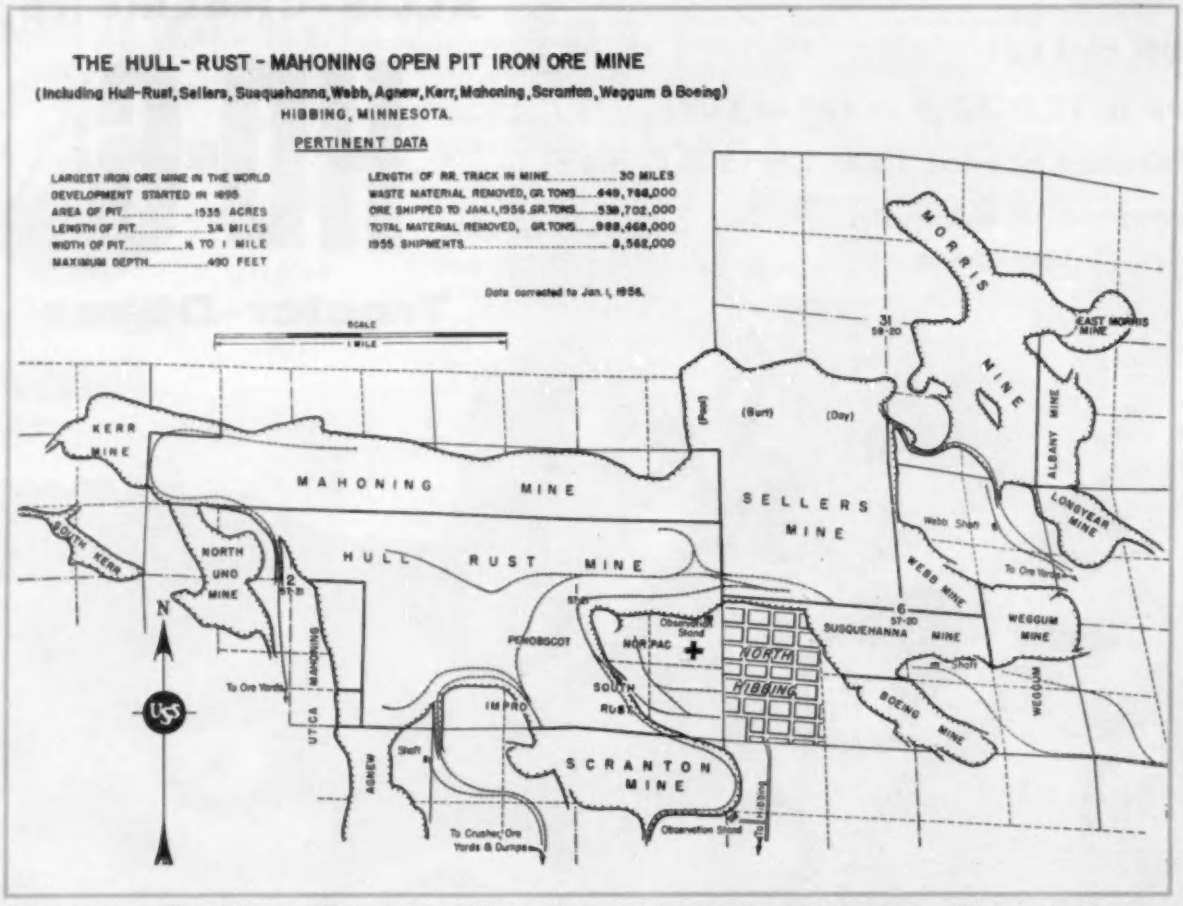
Tractor-Dozer

MORE POWER—BETTER DOZING SPEEDS—BIG-DOZER DESIGN—NEW HANDLING EASE!

Only dozer of its size with these basic advantages . . . engine-mounted rams, long push beams, fewer linkage points (only 2 instead of 5 or 6). These big-dozer features all combine to provide more accurate, gouge-free dozing . . . longer equipment life.

Convenient rotary-valve blade control makes the HD-6 the easiest handling dozer of its size. With more than 5½ feet of track on the ground, it has outstanding flotation . . . yet turns easily in any terrain. The HD-6 also combines large, low-set front idlers with a blade snugged close to the radiator guard . . . to provide balance that means better dozing, more work done under any conditions!

You can <u>see</u> it . . . but there's only one way to <u>prove</u> it—on **your** job!



Cross marks location of Norpac mine and area of North Hibbing to disappear as stripping removes 100 feet of overburden.

Long Walk . . .

Continued from page 36

from observation platforms around the mines.

Children were photographed inside the dragline's 30-yd. bucket or near other parts of the machine that dwarf a man or even a truck.

An interesting feature of the big stripper was its peculiar system of motivation. With a walking speed of approximately one-tenth of one mile an hour, it moved along the ground by means of cam-driven shoes connected to each side.

The shoes, operating simultaneously, lifted the machine, dragged it forward, settled it on the ground and then rose into the air to move ahead for another "step."

The 1150-B dragline recently completed stripping at the Morton mine, where it dug overburden for 4½ years before a ton of ore was shipped from that mine.

Used exclusively for stripping, the machine arrived on the Mesabi in 1948 and was assembled at the South Agnew mine under the supervision of Lloyd M. Bredvold, superintendent of the South Agnew, Morton and Weggum mines for Hanna, who directed moving operations.

The dragline, feeding its mobile screening plant and conveyor systems with a 30-yd. bucket, has stripped approximately 30 million yards of overburden for Hanna. It is capable of moving up to 1,800 yards per hour.

On its new assignment, the 1150-B will strip away the overburden from a section of North Hibbing to uncover an estimated 7 million tons of iron ore. The average depth of surface overburden is about 100 feet and a considerable amount of rock will have to be moved to get down to ore. This overburden will be scooped into the portable screen which will remove the rocks and feed the dirt onto a conveyor belt.

The 48-in. wide belt will carry the dirt some three miles to a dump. Initial stripping is being done with the dragline and trucks. The material is being used to build roads and fill for the belt line and stacker base.

While some of the ore is direct-shipping grade, a large tonnage will have to be concentrated. Present plans call for the erection of a beneficiation plant. The entire stripping and mining program will cover a 15-year period.

Farther to the south the Oliver Iron Mining Co. will cut across the present road between North and South Hibbing to begin a contemplated 15-year operation which will move some 20 million tons of overburden and 15 million tons of ore.

These statistics will help swell the one billion-plus gross tons of material which have been removed from the world's largest iron mine.

CONTRACT DRILLING

Specializing in Quarry Blast Holes
using
Ingersoll-Rand Drillmasters

NEW JERSEY DRILLING CO., INC.
Box 431, Madison, N. J. FRontier 7-5996

You can see it, but there's only one way to prove what the HD-6 can do for you!

Call your nearby Allis-Chalmers construction machinery dealer —he'll demonstrate one on your job NOW!

. . . or send us this

Allis-Chalmers
Construction Machinery Division
Milwaukee 1, Wisconsin

Gentlemen:

Please have the Allis-Chalmers construction machinery dealer serving my area arrange a demonstration of the HD-6 tractor-dozer for me.

Name_____

Address_____

City_____ State_____

Type of Work_____

WIRE ROPE AT WORK

This is a good trick if you can do it, and these four hard-rock men have it mastered. Suspended by means of wire rope above the chattering Cowlitz River, they are shown drilling bolt-holes at the site of the Mayfield Dam in southwest Washington. A project of Tacoma City Light, the dam will be 850 ft long and 185 ft high when completed.

Wire rope has numerous assignments on any big construction job, though not all of them are as spectacular as the one in the photograph. At the Mayfield Dam project, Bethlehem Purple Strand rope has seen service in many different ways; it has been one of the busiest items of equipment. And as always, Purple Strand has proved itself wholly reliable, day after day, in the heaviest, toughest kinds of lifting and hauling work.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

Make Big Stripper Bucket Loads BIGGER . . .
Swing A Bucyrus-Erie New-Design Bucket

A 14-cu. yd., medium-duty, new-design Bucyrus-Erie bucket is swung on the 215-ft. boom of a 650-B. Approximately 50 feet of overburden is being stripped to uncover a 6-ft. vein of coal.

Bucyrus-Erie new-design buckets *load fast*. Their weight is concentrated to help teeth, cutting edge and thin "slicing-action" lip penetrate swiftly. Material flows in easily because the basket is properly tapered. Buckets *carry smoothly* because they are properly flared and balanced to hold down bobbing and spillage. High arch and smooth inside design assure *clean dumping*.

Armored with BECOLOY

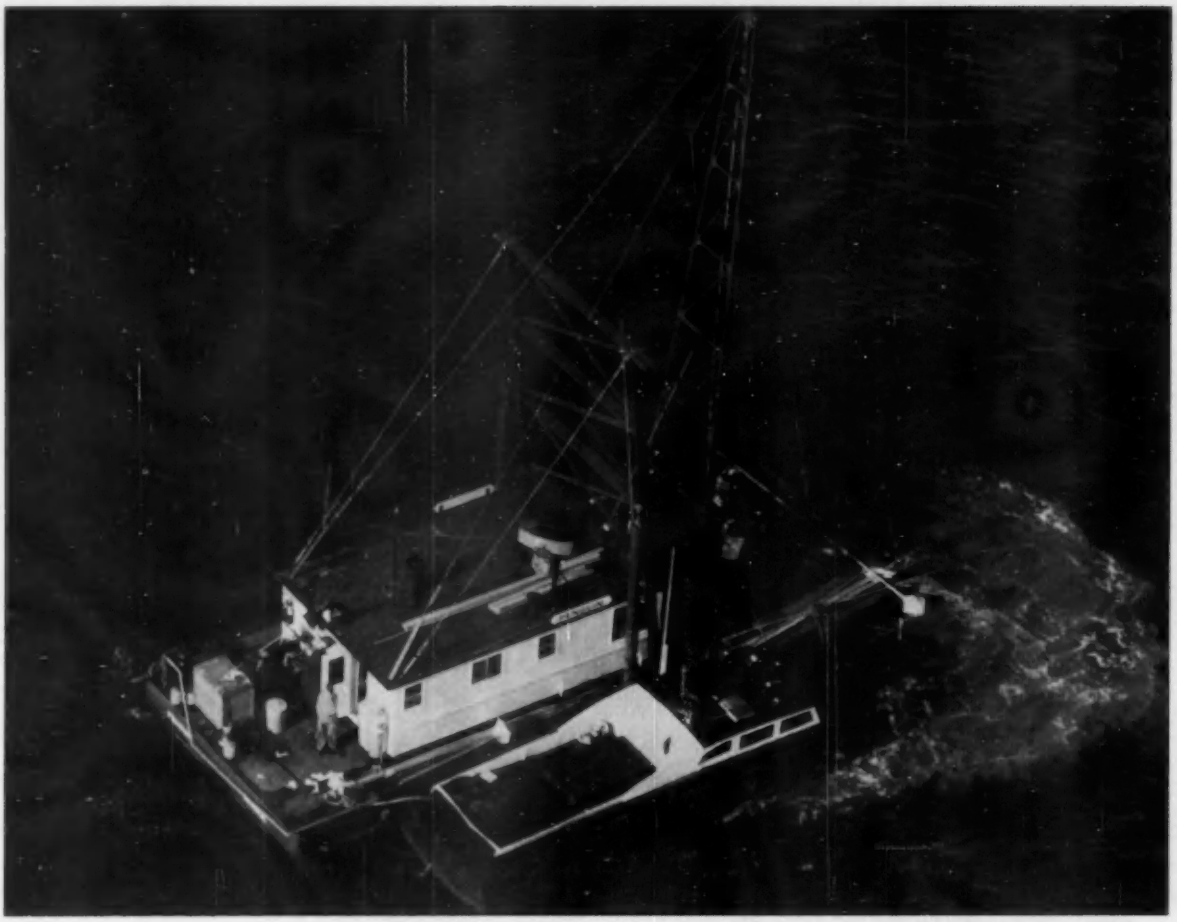
Equally important, use of BECOLOY gives buckets exceptional impact and shock resistance as well as hardness to resist wear. Exclusive with Bucyrus-Erie, BECOLOY has a tough fibrous structure, is readily cut with an acetylene torch and welded without special procedures.

A new-design Bucyrus-Erie bucket can help you improve the efficiency of your stripping operation. You can choose from a wide range of sizes . . . for light, medium or heavy duty . . . with solid or perforated baskets. Your Bucyrus-Erie distributor will gladly make recommendations that can make *your* big stripper bucket loads *bigger*.

26R57C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



Surveying for shells is done by a self-propelled boat, the *Penguin*, which has two 35-ft. spuds and a 40-ft. sounding rod.

Shells . . .

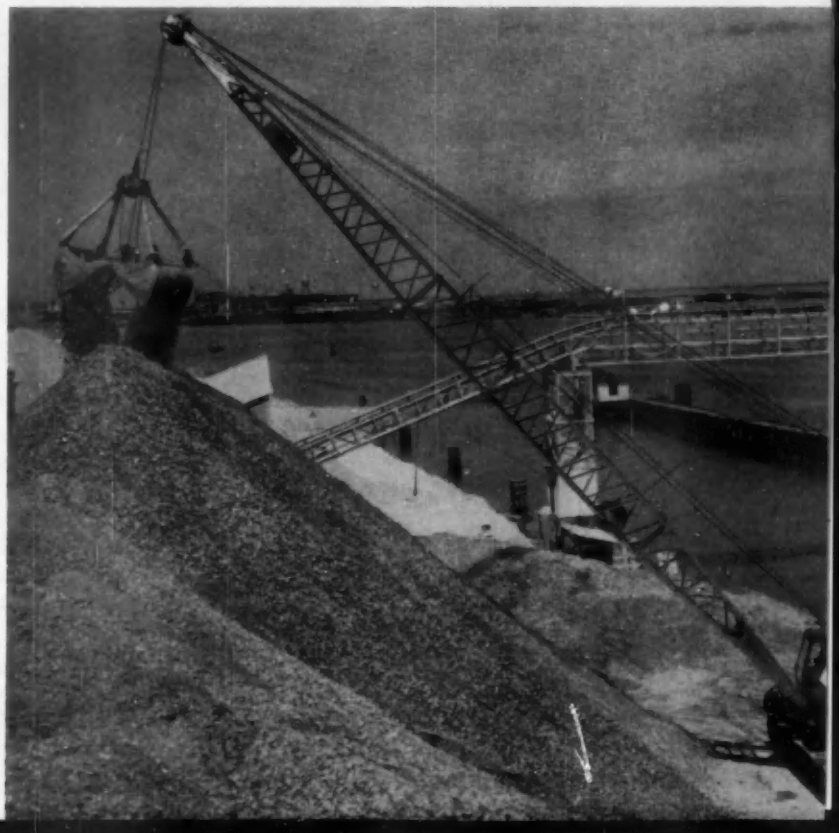
Continued from page 28

welders and fitters comprise the repair crew.

Bay Towing maintains a shell survey department, under the direction of Jim McConnell, to explore for and locate shells, determine the quantity and set the dredges on location.

A self-propelled (General Motors 6-71 diesel engine) boat, the *Penguin*, does the surveying. The *Penguin*, which draws 2½ feet of water, has two 35-ft. spuds and a 40-ft. sounding rod which is shoved down under 95 pounds of water pressure. The pressure is provided by 2½-in. Jabsco pumps.

The rod, paint-marked at 6-in. intervals, is shoved down as far as it can go, even though no shell is found. The *Penguin* drops buoys for test holes at 300-ft. intervals in two to five rows extending a half mile each. If more than four feet of shell is found in the holes



Reaching out and up, the crane drops a load of shells atop a growing pile.

further holes are drilled off range. Depth of water, mud and shell is recorded and dispatched to Bay Towing's McDuffie office, where the shell areas are plotted. When this is done, the dredges are positioned by radio.

The *Penguin* has located reefs as thick as 22 feet for dredges to cut. The survey boat has a continuing mission. It has sleeping accommodations for six men.

Lineup of Officers

Oyster shells, indeed, provide a good backbone for the Southern Industries structure. E. A. Roberts is chairman of the board; James McPhillips, vice chairman; R. H. Radcliff, Jr., president; and Dudley E. Dawson, executive vice president and treasurer.

Radcliff is president of both Bay Towing & Dredging Co. and Radcliff Gravel. Other Bay Towing officials include Jack W. Campbell, vice president and general manager; Jack Aldridge, superintendent-engineer; and Frank E. Haas, treasurer and office manager. Ezra B. Trice is vice president and general manager of Radcliff and J. O. Verneuille is vice president in charge of sales.

Dawson is president of Southern Oyster Shell Milling Corp. Other officers include: B. A. Wood, Jr., vice president in charge of operations; A. W. Brinkley, vice president in charge of sales; Herbert B. Harrison, plant superintendent; R. L. Crawford, Jr., treasurer; and Marvin Crabtree, general superintendent.

(Above) Radcliff's concrete blocks, known as Radstone, are marketed in three states. (Below) Cook Murrill Deese serves Engineer W. R. Jones aboard the *Albatross*.

Chatting are (from left) Ezra B. Trice, Radcliff vice president-general manager; J. W. Campbell, Bay Towing vice president-general manager; Ed Meredith, J. O. Verneuille.

How a cost-beating, can "unbind"

A TD-24 starts and gets "ready to run," seconds-fast. Morning, noon, or any other time you shut down the TD-24's diesel engine, you restart in seconds—and save yard-moving, wage-costing minutes! Exclusive International gasoline-conversion diesel starting does it—and the combustion-heated engine is ready to run as a diesel, without "gumming the works" with raw fuel!

TD-24 Cerametallic engine clutch eliminates time loss and upkeep cost of temperature-sensitive, "service-nervous" type clutches! You get the simplicity of long-familiar clutch design. You get the operating ease, temperature-immunity, and power-transfer efficiency of International Cerametallic facings. You get the instant readiness to operate perfectly when cold —plus heat-defiance for clutch-mauling jobs like 'round-the-clock shuttle-dozing.

TD-24 on-the-go shifting is a "double-barreled" cycle-speeder. The exclusive TD-24 two-speed planetary system gives instant, stall-preventing Hi-Lo shifting without declutching, in either the Torque-Converter or Gear-Drive models. And in the Gear-Drive model, you get two-direction "no-stop" shifting with exclusive synchromesh transmission.

TD-24 exclusive Planet Power steering eliminates load-limiting "dead-track drag"—gives full-time "live" profit power on both tracks. It's more than total engine hp or weight that

Announcing VM VALUE MEASURED

The exclusive equipment buying plan that value-measures used machinery and its components before you buy!

See VM buys now at your International Construction Equipment Distributor!

cycle-speeding TD-24 your profit squeeze!

Flores and Perry, Laton, California, depend upon three International "75" Payscraper® units and a TD-24 Torque-Converter crawler—to fulfill their 8-mile grade-raising subcontract, on Central Valley Highway south of Hanford. TD-24 push helps boil-in 20 cu yd heap-loads, in only 42 seconds!

counts—watch how "dead-track drag" limits any king-sized steering-clutch crawler to what it can handle on turns. Then watch how years-proved Planet Power steering gives the TD-24 full-time, both-track power—to pull or push extra-big loads on the turns or straight ahead, uphill or down!

TD-24 control ease puts record daily production at your operator's fingertips. Cool and safe flush-deck design, control-tower vision, and reach-easy fingertip controls all increase operator comfort and performance. Never before has big crawler work-power been so load-responsive—or record work-production so easy to achieve!

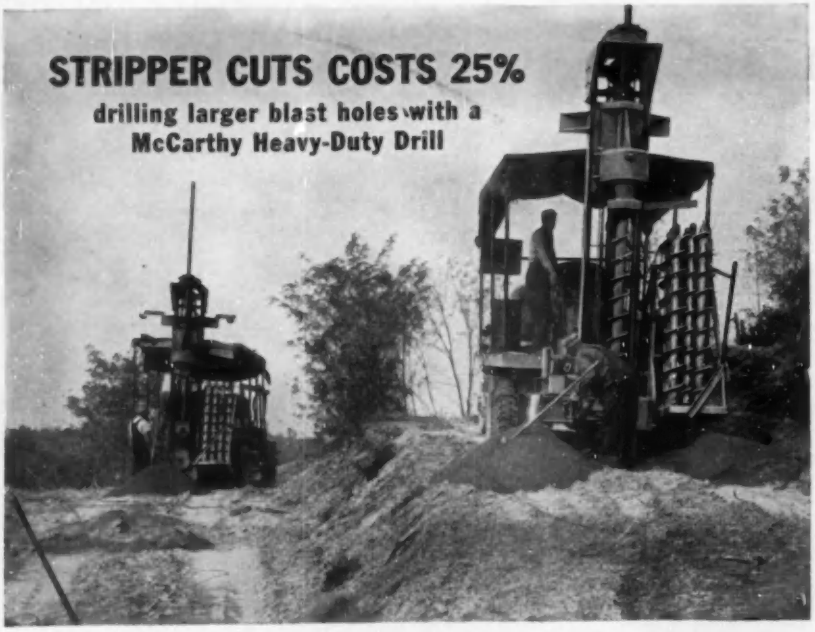
Prove positively your profit-margin widens—with geared-and-steered-for-action TD-24 power giving you the success-margin of push or pull! See your International Construction Equipment Distributor for a TD-24 demonstration!

"The TD-24's 2-speed track steering holds you in 'dozing position with no slide-slip or power loss in turning," states Operator Jack Campbell for Owner J. H. Marshall, Clovis, New Mexico. The Marshall TD-24 is shown dozing tough caliche rock for road surfacing.

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

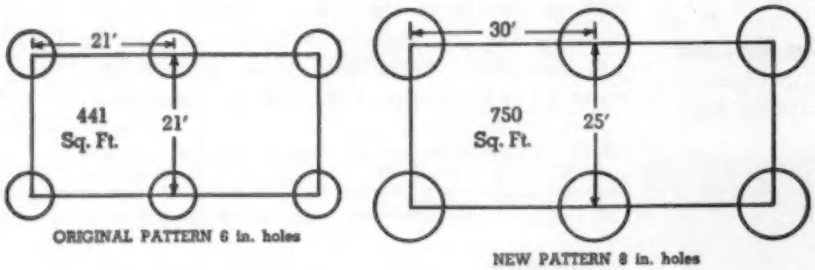


This strip mine operator cut drilling and blasting costs 25% by using this 25' x 30' pattern of 8 in. blast holes—drilled by two McCarthy Heavy-Duty Vertical Auger Drills.

A Southern Ohio strip mine operator cut his drilling and blasting costs by 25% when he widened the blast hole pattern and switched from 6 in. diam. to 8 in. diam. holes. He used McCarthy Heavy-Duty Vertical Auger Drills and a new type of explosive to remove the sandstone overburden.

A cost study made by the operator shows that the McCarthy drill bored the 8 in. holes at less cost than the 6 in. holes. Four 6 in. diam. holes covered 441 sq. ft. Four 8 in. holes covered 750 sq. ft. Since fewer 8 in. holes were required to drill the same area, over-all drilling time was cut in half. In each pattern, the amount of hard rock drilling was the same. The study included five work shifts of two McCarthy Model 106-24 Auger Drills, one using 6 in. and the other using 8 in. flights. The stripper figured all drilling and blasting costs, including fuel, labor, bits, explosives, etc. Over-all cost saving was 25%.

McCarthy Heavy-Duty Vertical Auger Drills drill up to 24 in. diam. holes faster than any other auger drill. Start cutting your costs now by phoning the nearest Salem Tool representative. Or write for Bulletin M-100.



ORIGINAL PATTERN 6 in. holes

NEW PATTERN 8 in. holes

Manufacturer of Drilling Equipment Since 1901

THE SALEM TOOL CO.

799 S. ELLSWORTH AVE. • SALEM, OHIO, U. S. A.

New Trade Literature

Subject: **Diesel Engines**

Content: A bulletin entitled *Principles of Trouble Shooting for Cummins Diesels* is designed to unfold so that it can be used as a wall chart. The chart lists some of the most common complaints that may be encountered during the service life of a diesel engine and notes probable causes.

Where to get: Service Div., Cummins Engine Co., Inc., Columbus, Ind., or Cummins distributors.

Subject: **Pile Hammer Leads**

Content: A new bulletin discusses the evolution and use of pile hammer leads, describes the basic lead types with their additions and variations and presents precise tabular data on weights and specifications of leads and accessories. The bulletin covers the following lead types: swinging; underhung vertical; underhung 6 to 1 and 3 to 1 fore and aft batters; extended 4-way batter; railroad pile driver leads; and the adaptation of hairpins, telescopes and extensions-above-the-boom-point to these leads. Information given on each item includes its use, types of pile for which used, exactly what types of jobs for which specific leads can and can't be used, and the advantages of specific equipment. Ask for bulletin 66.

Where to get: McKiernan-Terry Corp., 100 Richards Ave., Dover, N. J.

Subject: **Caterpillar Equipment**

Content: Three new pamphlets are available from Caterpillar. New life for old machines is the subject of the first booklet, *Repowering Made Easy*. Many old machines thought to be at life's end because power is down can be made productive again by repowering with a specially-designed engine package, according to the booklet. It describes through illustrations and successful installations how Cat diesel engines help raise production on old machines. Also listed are some of the optional equipment and factory service available for repowering. Ask for form D723. *Time to Consider*

Continued on page 63

Roebling Royal Blue Wire Rope will take **shock** after **shock** after **shock!**

This, and the fact that Royal Blue is stronger than the strongest you have been using, has helped to make it the most widely favored rope in Roebling's history. It will work hard and last longer on *your* job. Your distributor or Roebling Sales Office will give you full information, or write: John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Distributors, Branches and Warehouses Throughout the Country
Subsidiary of The Colorado Fuel and Iron Corporation

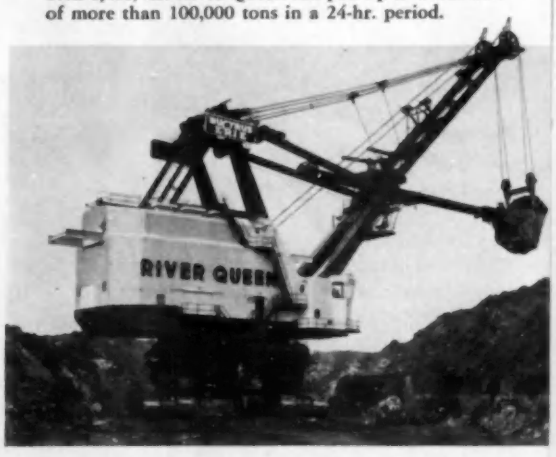
On the scene with the "RIVER QUEEN"

New Bucyrus-Erie 1650-B Stripping Shovel

TOWER OF STRENGTH! Sturdy front end of the River Queen rises high above the pit to a height of 140 feet from the ground to the top of the boom sheave.

BOARDING-HOUSE REACH! The River Queen piles earth and rock nearly 300 feet away from the digging point and stacks it more than 100 feet high.

BUILDING MOUNTAINS? Not quite, but with more than 80 tons of rock and earth in each cycle, the River Queen can pile up a "mountain" of more than 100,000 tons in a 24-hr. period.



WHAT AN APPETITE! 55 cubic yards per bite for the River Queen. Flexibility of boom and handle lengths permits the 1650-B to be equipped for 40- to 65-cu. yd. service.

This new 1650-B stripper is removing overburden, including a 10-ft. ledge of limerock, from two seams of coal at the River Queen Coal Company* mine near Central City, Ky. Equipped with a 145-ft. boom, 86-ft. handle and 55-cu. yd. dipper, it has a dumping reach of 147½ feet and a working range of over 300 feet.

Unique flexibility makes it possible to equip the 1650-B with the most suitable digging combination for a specific need. It is designed and built to handle dipper capacities from 40 to 65 yards, depending on the choice of boom and handle lengths. Dumping reach varies accordingly from 178 to 135 feet.

Here is quality in action — another example of stripping shovel performance in the finest Bucyrus-Erie tradition — combining unique flexibility with range, capacity, speed, and reliability to provide consistently high output at low operating cost. For further information, write us direct.

125L75C

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

** Owned jointly by W. G. Duncan Coal Co. and Peabody Coal Co., and operated by Peabody.*

A Familiar Sign BUCYRUS ERIE *at Scenes of Progress*

New Literature . . .

Continued from page 60

Traxcavators shows through on-the-job photos and reports many tasks that Traxcavators can handle. Describing these machines working in mining, construction, logging and other operations, the booklet also lists some of the available attachments which extend the machines' versatility. Ask for form D724. *Keep Them There* is the third new booklet. It explains how to keep earthmoving equipment on the job by proper dealer service. Pointing out that dealers have available the trained personnel and necessary equipment to handle any service or repair operation properly, the new booklet shows how the machine owner can save money by relying on the dealer to spot and correct difficulties which could cause later trouble. Ask for form D712.

Where to get: Advertising Div., Caterpillar Tractor Co., Peoria, Ill., or Caterpillar dealers.

Subject: **Steel Grating**

Content: An illustrated bulletin on Blaw-Knox grating and treads describes electroforged, riveted, rectangular, diagonal, "U" type and "T" interlocked types. Tables on safe loads and information necessary to specify are included. Ask for bulletin 2527.

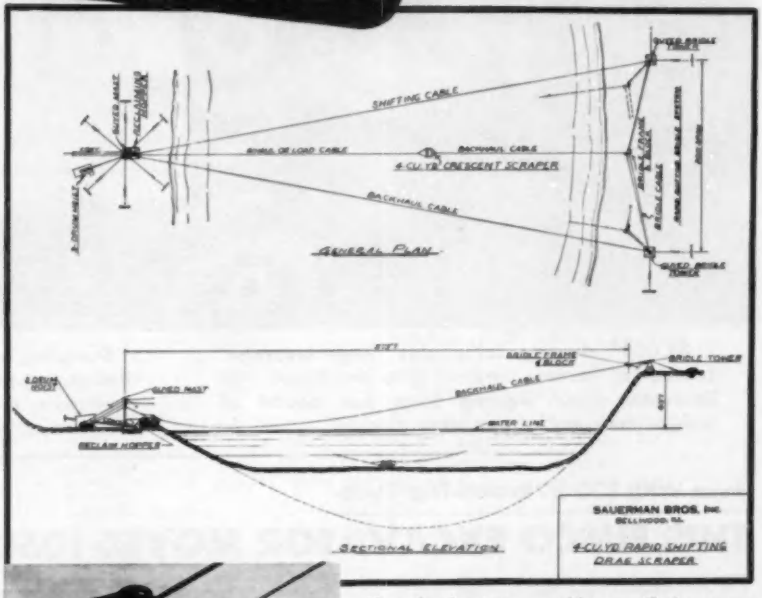
Where to get: Grating Dept., Blaw-Knox Co., P. O. Box 1198, Pittsburgh 30, Pa.

Subject: **Tractor Operator's Manuals**

Content: Two new manuals are available for operators of Eimco model 105 tractor-excavators and model 105 front end loaders. The tractor-excavator 24-page manual offers tips for efficiency in operation of the overhead loader as well as detailed information on preventive maintenance. Safety precautions also are emphasized. The brochure's number is B-L1055. The front end loader booklet is a 4-page pamphlet which delineates efficient operation of the new attachment for the basic model 105 tractor. The booklet also offers tips on operation of the fork lift attachment, a hydraulically-operated tool which is interchangeable with the bucket of the front end loader. Ask for B-L1056.

Where to get: Eimco Corp., 634 S. 4th West St., Salt Lake City 1, Utah.

the SAUERMAN METHOD..... **Scraper Machines Engineered to Your Operation**



Above drawing was prepared for a specific drag scraper installation and does not represent maximum spans.

View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying load to reclaiming hopper just in front of mast.

•

Contact Sauerman's engineering department for specific recommendations and information. No obligation.

Ask for Catalog A, Drag Scrapers—24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.

The Sauerman Method works equally well over widely differing areas and span limits . . . on hills, swampy ground or underwater . . . handles any material a dragline can dig.

Every scraper machine is powered by a Sauerman Roller Bearing Hoist, especially designed to withstand sudden shocks and changes in speed.

When a rapid shifter is used, a third hoist drum is added to shift the bridle frame. The rapid-shifting bridle system (upper right of drawing) permits frequent shifting of the scraper's line of operation in non-caving material, shallow excavations or overburden.

Operating costs are lower—basically, it is cheaper to drag material than it is to lift and transport it. You eliminate the power costs of moving heavy machinery about the area. You pay only for pay loads—not dead weight. When expendable parts—sheaves, clutch or brake linings—are replaced, the machine is restored to practically new condition.

Sauerman can help you select the method of materials handling most profitable for your job—a system that will give you the lowest cost per cu. yd. handled.

SAUERMAN BROS. INC.

622 S. 28th AVE. | BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

39,000# digging force plus "high leverage" contour of rocker arms . . give the Eimco 105 Excavator more digging force per pound of weight than any comparative machine.

Dumping into haulage units or fills, ability to discharge without turning gives the Eimco more productive motion per unit of expelled energy than any other earthmover.

Even With 100 ft. Round-Trip Cycle

THIS EIMCO EXCAVATOR MOVES 1050 TONS IN 7 HOURS

An Eimco 105 Excavator loads out large boulders and loose overburden without the aid of preliminary shooting . . . hauls 50 ft. to the edge of a fill . . . and discharges 500—3-ton-loads every 50 minute work hour.

Ability to complete a cycle without turning is a big Eimco Excavator advantage, regardless of haul length. But as travel distance decreases, the 105's loading speed increases in much greater proportion than that of conventional loaders.

When trucks can be spotted a few feet behind, and with good availability . . . the 105 can complete 6 cycles per minute and toss between 600-800 tons of heavy rock over its back every hour.

On projects with confined working space, the Eimco Excavator's cubic yard capacity per $ of investment increases sharply while the conventional loader's value decreases. Loading in tight quarters or on narrow benches, conventional machines must maneuver "back and forth" to reach dump position. This curtails production, increases operator fatigue, jeopardizes safety and "bottlenecks" hauling operations. These profit-stealing disadvantages are eliminated by the 105.

With either the Excavator or the Eimco 105 Front-End Loader (2½ yd., 40,000# break-out) you get a big mobility edge. Under full load . . . at top speed . . . moving forward or reverse . . . both 105 Loaders respond instantly to gear reversals, high-lo shifts, independent track operation—all controlled by easy-to-operate, power-shift levers.

An Eimco Sales Engineer will be happy to conduct a time study of your operation and show you the way to more profit!

EIMCO FRONT-END LOADER

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-870

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

2-W Monighan Walking-Type Dragline #492, 85' boom, 2-year old D-13000 Caterpillar diesel engine #4S685, 2-yard Hendrix bucket, 2½ yard Page bucket, some spare parts, fair operating condition. Box 3708

Model 7-W Bucyrus-Erie dragline; machine is equipped with 180' boom, powered with a Cooper-Bessemer GS-6 diesel engine; located in western New York. For price and other details contact Tecon Corp., 2nd Floor Davis Bldg., Dallas, Texas, Mr. E. R. Funk.

Bucyrus-Erie Model 5-W Diesel dragline, 100' boom, 25' insert extension. Fairbanks-Morse main engine, auxiliary 100 HP Cummins for swing generator, includes two (2) Esco buckets, one five yard and one six yard. Owner using machine and can be inspected in actual operation, very good operating condition, located in Northern Illinois. Price including buckets and approximately $5000 worth of spares. $60,000 as is. Box 3716

Bucyrus-Erie 200-W diesel dragline shipped in 1950; 125 ft. boom, 6 yd. heavy duty and 7 yd. light weight buckets; some spare parts included; good mechanical condition. Location Melbourne, Australia. Box 3682

SMALL SHOVELS, CRANES, DRAGLINES—UP TO 2½ YDS.

Bucyrus-Erie 22-B ¾-yd. dragline, serial 80492 (9-7-50) with Cat D315 diesel engine with electric starting; located in Denver, Colo.; being reconditioned in our plant.

Bay City Model 25 ½-yd. dragline, serial 5557 (1950) with ½-yd. bucket, powered by Cat D315 diesel engine; located in Denver, Colo.; good condition.

Lorain L-80J 1¾-yd. shovel, serial 23550 (1953) with Cat D337 engine, fluid coupling and air control; located in Denver, Colo.; used only 2,000 hours.

Pioneer 101 asphalt plant (1950) diesel-electric powered; complete with gradiation unit, 90"x24' drier, dust collector, hot elevator, cold conveyor and two aggregate feeders; located in Sundance, Wyo.; condition and appearance good.

Barber-Greene 848 asphalt plant (1950), diesel powered; complete with cold elevator, 96"x20' drier, dust collector, two hot elevators, gradiation unit and pugmill; also included with plant is a Model 82A paving loader for travel mix operation; located in Denver, Colo.; condition and appearance good.

THE COLORADO BUILDERS' SUPPLY CO.
1534 Blake Street WEst 5-3571
Denver 2, Colorado

One Bucyrus-Erie Model 41-B, 3 motor AC electric shovel, serial no. 10796, 1½-yd. dipper, cat-mounted, 26" treads; 22'6" boom, 15' handle; good operating condition. Many replacement parts for swing and crowd machinery recently installed or available. Located Mid-West.

One Bucyrus-Erie Model 52-B, Ward-Leonard electric shovel, serial no. 11395, equipped for 3 phase, 60 cycle, 440 volt operation; 2¼ cubic yard dipper, 30' boom, 18' handle; equipped with power boom hoist and electric light plant. Well maintained and in good operating condition. Caterpillar units recently overhauled. Located Mid-West. Box 3710

SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

SHOVELS — CRANES — BACKHOES

Bucyrus-Erie Model 29-B, 1-cu. yd. shovel with 45' boom, fairleads; powered by Caterpillar diesel engine; operating condition.
F.O.B. Louisville, Ky. $4,950

Bucyrus-Erie Model 10-B, ⅜-cu. yd. backhoe, crawler mounted, gasoline engine; perfect condition—less than two years' use.
F.O.B. Louisville, Ky. $9,800

"QUICK-WAY" Model L, ½-cu. yd. shovel and 35' boom for dragline, powered by International UD9 diesel engine, mounted on a White half-track, excellent operating condition, engine recently overhauled.
F.O.B. Louisville, Ky. $7,000

Bucyrus-Erie Model 15-B, ½-cu. yd. backhoe on crawlers, powered by International UD350 diesel engine, perfect operating condition.
F.O.B. Louisville, Ky. $11,200

Shield Bantam Model M49, ⅛-yd. capacity backhoe, powered by LeRoi gasoline engine, equipped with crane boom, mounted on a White (army surplus) halftrack.
F.O.B. Louisville, Ky. $7,500

Unit Model 514, ½-yd. shovel, powered by Chrysler C-36 gasoline engine.
F.O.B. Mount Vernon, Ill. $3,500

Koehring Model 304, ¾-yd. backhoe, crawler mounted, powered by International Model UD14 diesel engine.
F.O.B. Evansville, Ind. $10,500

Shovel Front for Bucyrus-Erie 10-B, ⅜-yd.
F.O.B. Louisville, Ky. $850

Shovel Front for Bucyrus-Erie 15-B, ½-cu. yd.
F.O.B. Louisville, Ky. $1,275

Dragline equipment, including 35' boom for Bucyrus-Erie 22-B.
F.O.B. Evansville, Ind. $1,250

BRANDEIS MACHINERY & SUPPLY CO.
Write—Wire—Phone
L. L. Freeman P. O. Box 27, Evansville, Ind. HArrison 3-4491
Jim Waddell P. O. Box 1705, Louisville 1, Ky. MElrose 7-4741

Bucyrus-Erie 15-B dragline excavator with 30' boom, Cat diesel engine with electric starter, Unit 76 tractor type crawler mounting with 20" wide grousers, Unit 79c counterweight; machine serial #115288; has been used 650 hours. Price, f.o.b. Greensboro, N. C. $18,500

Northwest 25 shovel front with ¾-yd. dipper. Price, f.o.b. Greensboro, N. C. $1,500

Northwest 25 combination dragline, clamshell shovel with Murphy diesel engine, serial #14716. Price, f.o.b. Greensboro, N. C. $14,000

Northwest 25 dragline with 40' boom (one 1' insert), 3-71 GM engine, ¾-yd. TS Hendrix bucket and 28" flat bottom shoes.
Price, f.o.b. Greenville, N. C. $8,000

Unit model 1020 dragline w/gasoline Chrysler engine, long wide crawler frame, 30" shoes, ¾-yd. Hendrix bucket and 40' boom
Price, f.o.b. Greenville, N. C. $7,500

E. F. CRAVEN COMPANY
Greensboro North Carolina

Link-Belt heavy duty dragshovel, Model LS-85, ¾-yd., powered by Cat D8800. This machine recently gone over in our shop. Ready to work.
Koehring shovel front for Model 303, ¾-yd.
Link-Belt shovel front for Model LS-40, ½-yd.
Lorain backhoe front with bucket for Model TL-20, ½-yd.
Lorain shovel front for Model TL-20, ½-yd.

BEMISS EQUIPMENT CORPORATION
2219 Chamberlayne Ave. Richmond 22, Va.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

FOR SALE

DRAGLINES AND CRANES

2400 Lima Dragline, 130', 5-yd.
1201 Lima Dragline, 85', 3-yd.
955 P&H Dragline, 90', 2½-yd.
54-B Bucyrus-Erie Drag, 85', 2½-yd.
3500 Manitowoc Drag, 85', 2½-yd.
903 Osgood Dragline, 70', 2-yd.
802 and 604 Lima Cranes
3000-B & 3500 Manitowoc Cranes

SHOVELS AND COMBINATIONS

1055 P&H 3½-yd. Standard Shovel
1201 Lima 3½-yd. Standard Shovel
1201 Lima Combination Shovel-Crane
955 P&H 2½-yd. Standard Shovel
80-D Northwest 2½-yd. Shovel
802 Lima Comb. H.L. Shovel-Drag
51-B Bucyrus-Erie 2-yd. Shovel
44 Lima 1-yd. Backhoe
25 Northwest Combination Shovel-Drag
Unit 1020 ¾-yd. Shovel
34 Lima ¾-yd. Shovel

TRUCK CRANES, EUCLIDS, DRILLS, Etc.

255 P&H Truck Cranes
MC-425 Lorain Truck Cranes
22-B Bucyrus-Erie Truck Cranes
LC-90 Link-Belt Speeder T.C.
MC-414 Lorain Truck Crane
Euclid Trucks: 27FD, 86FD, 2FD, 82FD, 36FD, 8TD, 63TD, 59TD, 60TD, 4-FFD
600 Reich Heavy Truck-Mounted Rotary Air Drills
58-BH Joy Champion Rotary Air Drills
42-T, 29-T and 27-T Well Drills
Davey Rotary Truck Air Drills
Mayhew Rotary Truck Air Drill
Garwood, LeTourneau, Caterpillar, Euclid and Bucyrus-Erie Scrapers
Caterpillar & Allis-Chalmers Dozers, Front End Loaders, Graders
International Bulldozers
Shovel, Drag, Crane & Backhoe Attach., Drag & Dipper Buckets for most makes and models.

FRANK SWABB
EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Building
Hazleton, Pa. GLadstone 5-3658

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

2-Yd. MODEL 820 LORAIN CRAWLER CRANE equipped with 100′ boom, Cat diesel engine. Entire machine in very good working condition and is available immediately; located in Milwaukee.

2-Yd. MODEL 820 LORAIN CRAWLER CRANE-SHOVEL COMBINATION; equipped with Cat D-13000 diesel engine, standard crawlers, 70′ boom, fairlead, maximum counterweight, new boom and like-new shovel attachment. Good condition; located at Milwaukee; available immediately.

1½-Yd. KOEHRING MODEL 605 CRANE-HOE COMBINATION; Cat D-13000 diesel engine, 60′ boom, new hoe attachment. Excellent condition. Call for location to inspect.

1¼-Yd. MODEL 33-B BUCYRUS-ERIE ERECTION CRANE with 100′ boom and jib, independent boom hoist, gas power. Very good condition; will be available late in June. Priced right for a big machine.

1-Yd. MODEL LS-90 LINK-BELT SHOVEL, Waukesha gas power; entire unit in like-new condition. Priced at about half of new replacement cost.

¾-Yd. MODEL 25 NORTHWEST CRANE-SHOVEL COMBINATION, equipped with Cat. D-4600 diesel engine, 45′ boom, tagline reel, fairlead. Excellent condition. Located at our Milwaukee yard.

½-Yd. UNIT CRAWLER-MOUNTED DRAG-SHOVEL, equipped with Chrysler Industrial gas engine. Fair condition and priced to sell. See at our yard.

J. P. WAITE CONSTRUCTION CO.
3308 West Pierce St. Milwaukee 15, Wis.
Phone: EVergreen 4-1900

Koehring Model 303 Dragshovel ¾-cu. yd. bucket with 24″ crawlers and Buda gasoline engine. Good buy.

Bucyrus-Erie 15-B Comb ½-yd. backhoe and clamshell machine with Buda gasoline engine and electric starter.

S. M. CHRISTHILF & SON, INC.
Timonium Rd. & Harrisburg Expwy.
VAlley 5-5100 Timonium, Md.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Lima model 34 backhoe, ¾-yd. bucket, crawler type, 20′ cambered boom, GMC 3055-c diesel engine, serial #326916, year 1951.

Bucyrus-Erie 22-B backhoe, ¾-yd. bucket, 26″ track pads, 6-cylinder Buda gas engine, serial #73221, year 1949.

General Powershovel Model 310, shovel front ¾-yd. bucket, Cat type w/26″ track pads, model 525 Buda engine, serial #2987, year 1950.

Lorain model TL-25 shovel combination, ¾-yd. shovel and 36″ backhoe, crawler type, Cat D315 diesel engine, serial #19711, year 1950.

Hough HR Payloader, serial #42888, year 1953, 1⅛-cu. yd. bucket, QXLD-3 Hercules gas engine, reconditioned.

Hough HMG Payloader, serial #90786, year 1951, JXD Hercules engine, 1½-cu. yd. bucket, rebuilt.

Trojan LC100 Loadster, serial #C-112, year 1952, IHC S240 engine, torque converter, 87″ bucket, reconditioned.

Trojan LC100B Loadster, serial #C-248, year 1953, IHC S240 engine, 2-cu. yd. bucket, reconditioned.

DOW & COMPANY, INC.
1820 Elmwood Avenue Phone VI 4100
Buffalo 7, New York

MISCELLANEOUS EQUIPMENT

Model 27-T blast hole drill, serial No. 19628, Waukesha gasoline power, crawler-mounted, 33′ one-piece all-steel derrick complete with tools in good working order. Located in Missouri. Priced to sell. Box 3719

$150 buys shovel front for Bucyrus-Erie 10-B, real bargain, all complete, like new condition, bucket extra good. Counterweight only $75. 1625 E. Kearney, Springfield, Mo.

Model 27-T blast hole drill, serial No. 18269, Waukesha gasoline power, crawler-mounted, 33′ one-piece all-steel derrick complete with tools in good working order. Located in Missouri. Priced to sell. Box 3718

MISCELLANEOUS EQUIPMENT

FORD MODEL JD-1025 GASOLINE ENGINE with radiator-flywheel, ring gear and starter. $200.

***ALL PRICES—**
F.O.B. SOUTH MILWAUKEE, WISCONSIN
BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.

New 18″ dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 van runner; spare liners Box 3696

Trench hoe—Shovel Front for Osgood 200. Practically new .....$500 each
Pile driving leads, hammer, etc. $400
1947 GMC, 623 Tractor and Jahn 20-ton drop center lowboy, rough but serviceable. Price $1,000

KIRKPATRICK CONSTRUCTION CORP.
P. O. Box 380 Hopkinsville, Kentucky

Caterpillar D-8 Tractors with Dozer; Allis-Chalmers HD-19 and HD-20 Tractors; Caterpillar DW-20 and DW-21 Scrapers; LeTourneau F.P. and W Scrapers; McCoy 60″ Sheepsfoot Roller; LeTourneau 48″ Sheepsfoot Roller; Caterpillar Model 28 Ripper; Barber-Greene Hot Plant Model 848.

All equipment completely overhauled, first class condition, ready to work.

STANLEY H. ARKWRIGHT, INC.
Box 1211 Phone 7-7864
Billings, Montana

ONE—2¼-YD. COAL LOADING DIPPER, NEW FOR 38-B. LOCATED NEAR PITTSBURGH. $2500.
BOX 3720

Hydro-elec. generator sets (2), 2000 hp ea., 160′ hd.
Monighan walking draglines (7), 3-yds. to 10-yds.
Page Models 625, 620 walkers; 6, 7, 10-yds.
Plymouth, Porter locomotives, 25, 44, 70 tons.
Bucyrus 4½′ gold placer dredge, diesel; Africa.
Lima 1201 diesel 3½-yd. shovel-dragline.
4000 KW floating diesel-elec. power plant, 2300 v.
Diesel-electric generators, 500-3500 KW.
Cranes; diesel, crawler, 1½-yd. to 75 ton cap.
Johnson, Noble concrete batching plants (2).
Koehring Dumptors. Euclid rock trucks (8).

H. Y. SMITH CO.
828 North Broadway Milwaukee 2, Wis.

EQUIPMENT WANTED

Wanted for cash: Manitowoc Models 3900 and 3500; also late Northwest 6 backhoe or dragline with long wide crawlers. M. P. McCaffrey, 2121 E. 25th St., Los Angeles, Calif.

CLAMSHELL CRANE FRONT FOR BUCYRUS-ERIE 54-B SHOVEL
ILLINOIS SLAG & BALLAST CO.
2817 E. 99th St.
Chicago 17, Ill.

Backhoe and crane boom for Link-Belt LS50. State condition and best price.

JIM WADDELL
P. O. Box 1705 Louisville 1, Ky.

FOR RENT

FOR RENT: 2-yd. 51-B shovel, 18x23, new 1951, perfect condition, will rent to reliable contractor. May consider sale. Box 547, Somerset, Pa. Phone 4200.

If you are Buying or Selling Used Equipment, this is the place to let the Excavating Industry know about it.

FOR 50 YEARS...
Finest in the Field!
Contractors know and decide on Omaha Dragline Buckets for every use. They base their opinion on three important points:
• Lower First Cost
• Lower Operating Cost
• Lower Repair Cost
Strike pay dirt now!
Complete information and specifications await your letter.
DRAKE-WILLIAMS MOUNT
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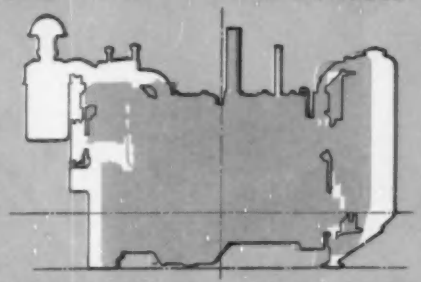
DRAGLINE BUCKETS

New CAT* DIESELS

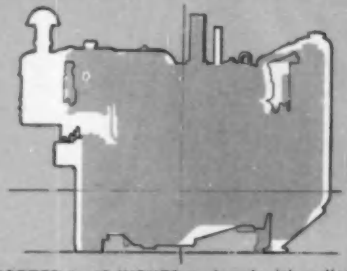
FOR YOUR EXCAVATING EQUIPMENT. MORE POWER IN LESS SPACE WITH LESS WEIGHT

D318 (Series G)
175 HP† **TURBOCHARGED**



SHORTER by 19 INCHES equipped with radiator
LIGHTER by 370 POUNDS

D315 (Series G)
115 HP† **TURBOCHARGED**



SHORTER by 16 INCHES equipped with radiator
LIGHTER by 250 POUNDS

FAST FACTS ABOUT THE NEW D318 (SERIES G) AND D315 (SERIES G) DIESELS

The over-all length of the D318 (Series G), including radiator and air cleaner, is 19 inches shorter than a similarly equipped D318. The D315 (Series G), including radiator and air cleaner, is now 16 inches shorter than the D315.

Without attachments, the over-all fan-to-flywheel dimensions of the basic Series G engines are as follows:

D318 (Series G)		D315 (Series G)
55 27/32"	LENGTH††	42 27/32"
32 7/8"	WIDTH	32 11/32"
42 17/32"	HEIGHT†††	42 3/32"
2,400 lb.	WEIGHT	1,950 lb.

In the main, three items were changed to make these shorter dimensions possible.

1. Direct electric starting, standard on Series G engines, eliminates the extra length formerly required for the gasoline starting system.

2. Compact, more efficient air cleaner, located in a new position, gives both a shorter and lower engine.

3. New timing gear train and housing occupy only half the former length.

Redesigning these three items, and other minor changes, made it possible to decrease the weight of these engines by 370 pounds on the D318 and 250 pounds on the D315.

†*Maximum output capacity. Also available naturally aspirated.*
††*Fan to flywheel.* †††*Excluding exhaust stack.*

Now you can use rugged Cat D318 and D315 Engines for smaller installations

Without removing any of the basic structures that made them so durable and so economical to operate, Caterpillar has developed new units to fit special applications where space and weight are important factors. Shorter, lighter and more powerful, these new units are the D318 (Series G) and D315 (Series G) Engines. From fan to flywheel, they are modern, heavy-duty diesels, designed to give you compact power with minimum down time.

The new Series G engines do not replace the famous D318 and D315 in the Caterpillar line. They *add* to it to give you a wider choice than ever for your original or replacement power requirements. Leading manufacturers can supply them in the equipment they build. For complete information about them, see your Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

A QUARTER CENTURY OF DIESEL LEADERSHIP

ROAD PUSHED THROUGH *1,700 Foot Swamp Area*

This swamp area was de-mucked and filled to provide a roadbed for a four-lane arterial route in Utica, N. Y. Marlow self-priming pumps, seen in the right foreground, were used to control and remove water.

Marlow Pumps Control Water Throughout De-mucking Operations

D. W. Winkelman Co.,Inc., of Syracuse, is currently working on a 1.2-mile portion of a north-south arterial route in Utica, N. Y. The construction of this $4,474,259 segment of the road, with four lanes, is scheduled for completion in December. 1958.

One of the major problems the Winkelman organization tackled on this job was a swamp area 1,700 feet long. Muck went down as deep as 15 feet below ground level. A crane with a 70-foot boom and dragline bucket was used for "muck-out" operations. Approximately 1,000,000 cubic yards of barrow was used as fill.

During the entire "muck-out" and fill operation, two Marlow 8-inch and one 10-inch, engine-driven, self-priming, contractor pumps were used to control and remove water from the area. With all three pumps in operation at the same time, they handled up to 540,000 gallons per hour! In emergency situations, the three Marlow self-primers were capable of pumping 558,000 gallons per hour.

If you have a tough dewatering problem, look to Marlow for your answer. Marlow builds a complete line of AGC-rated contractor pumps as well as famous "Mud Hog" diaphragm pumps for handling muddy and trash laden liquid. Marlow pumps are readily available from three factories and from hundreds of dealers in all localities. Look under the heading, "Marlow Pumps," in the "Yellow Pages" of your classified telephone directory for the name of your Marlow Dealer.

For complete information, write today for a copy of Contractor Pump Bulletin C-04.

Two of the three big, engine-driven, self-priming contractor pumps used on the project for dewatering operations are shown above. D. W. Winkelman Co., Inc. used two 8-inch and one 10-inch Marlow self-primers on the job.

Marlow PUMPS

7-126

DIVISION OF

BELL & GOSSETT CO.

Midland Park, N. J.

Morton Grove, Illinois Longview, Texas